

## F16K

**VALVES; TAPS; COCKS; ACTUATING-FLOATS; DEVICES FOR VENTING OR AERATING [N: (devices for emptying and evacuating the excess liquid in valves or conduits F16L55/07)]**

### F16K 1/00

**Lift valves [N: or globe valves], i.e. cut-off apparatus with closure members having at least a component of their opening and closing motion perpendicular to the closing faces ([N: in combination with sliding valves F16K3/246, F16K3/267]; diaphragm valves F16K7/00)**

#### References relevant to classification in this group

*This subclass/group does not cover:*

Functional types of lift valves	<a href="#">F16K 15/00</a> <a href="#">F16K 17/00</a> <a href="#">F16K 24/00</a> <a href="#">F16K 31/00</a> <a href="#">F16K 31/06</a>
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#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

In combination with sliding valves	<a href="#">F16K 3/246</a> , <a href="#">F16K 3/267</a>
Diaphragm valves	<a href="#">F16K 7/00</a>

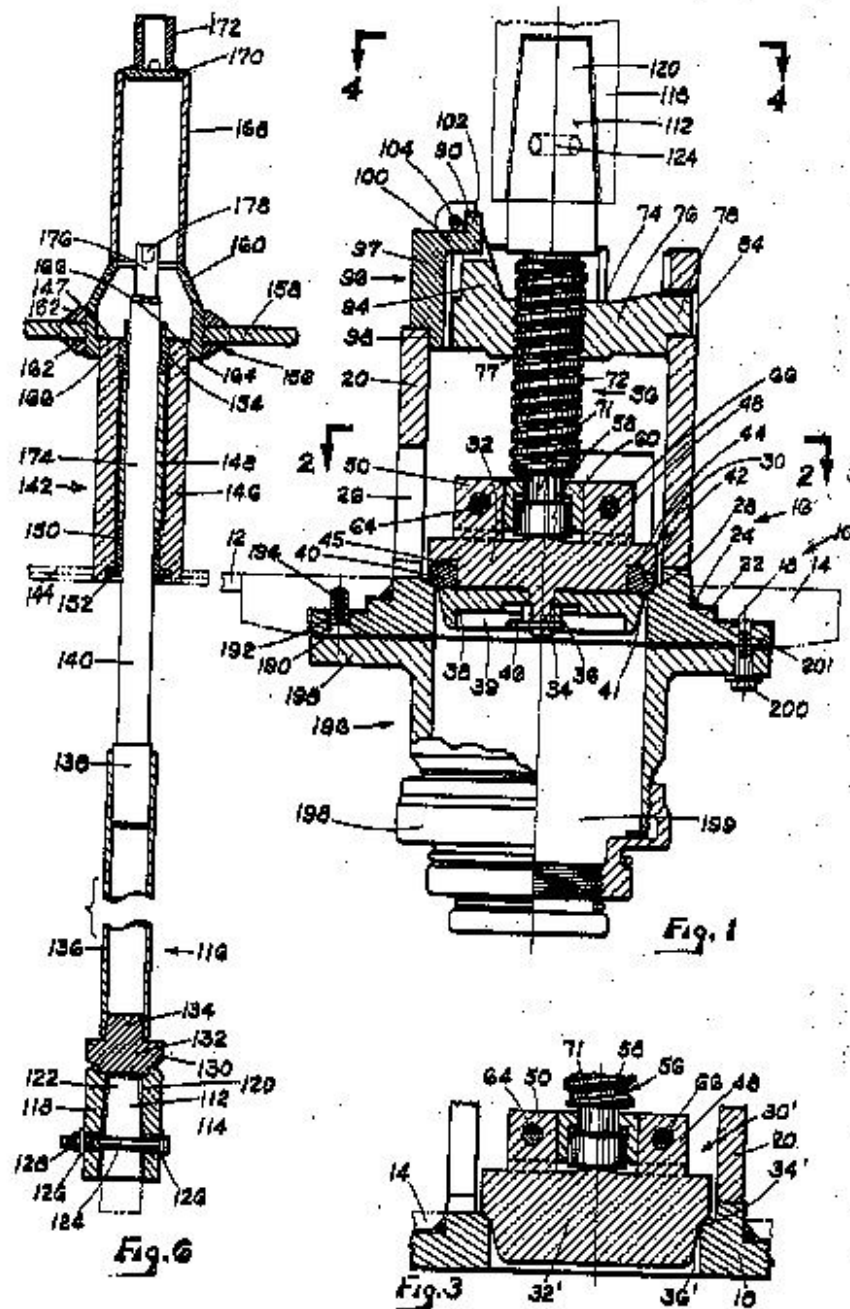
### F16K 1/02

**with screw-spindle (F16K1/12 to F16K1/28 take precedence; actuating mechanisms with screw-spindles F16K31/50)**

#### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



### Informative references

Attention is drawn to the following places, which may be of interest for search:

For the actuation mechanism

[F16K 31/50](#)

## F16K 1/04

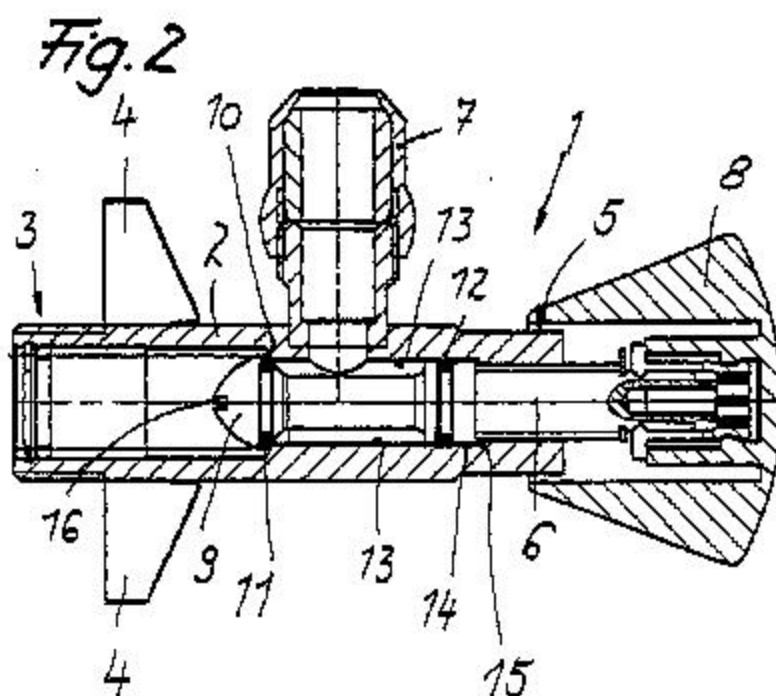
with a cut-off member rigid with the spindle, e.g. main valves

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

EP 1 273 836 A2



## F16K 1/12

with streamlined valve member around which the fluid flows when the valve is opened

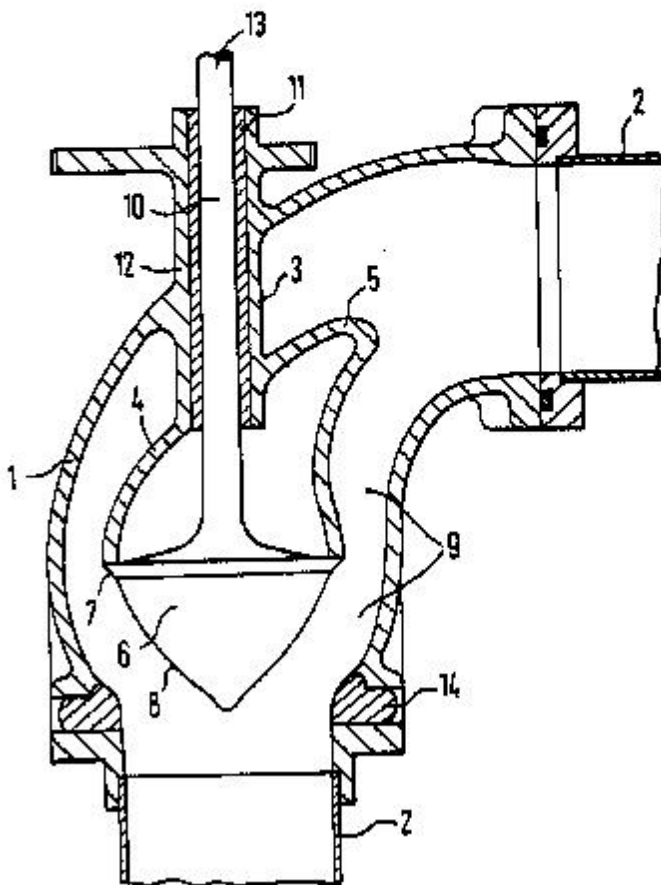
### Definition statement

*This subclass/group covers:*

The valve member is within the flow passage.

Illustrative example:

1/1

**F16K 1/123**

[N: with stationary valve member and moving sleeve]

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

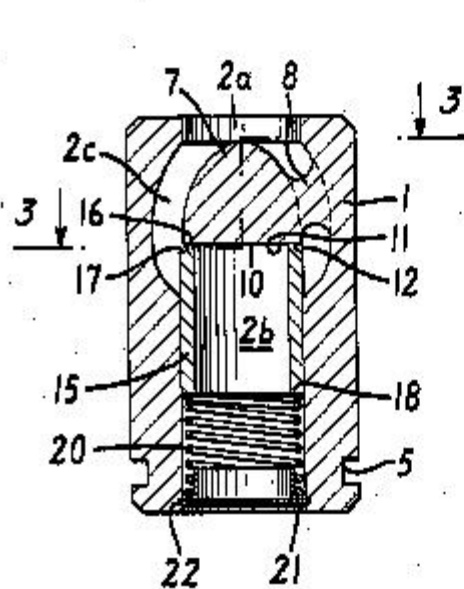


FIG. 1

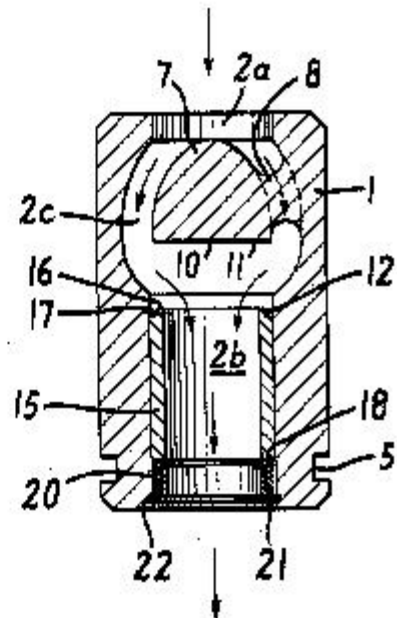


FIG. 2

**F16K 1/126**

[N: actuated by fluid]

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

3/4

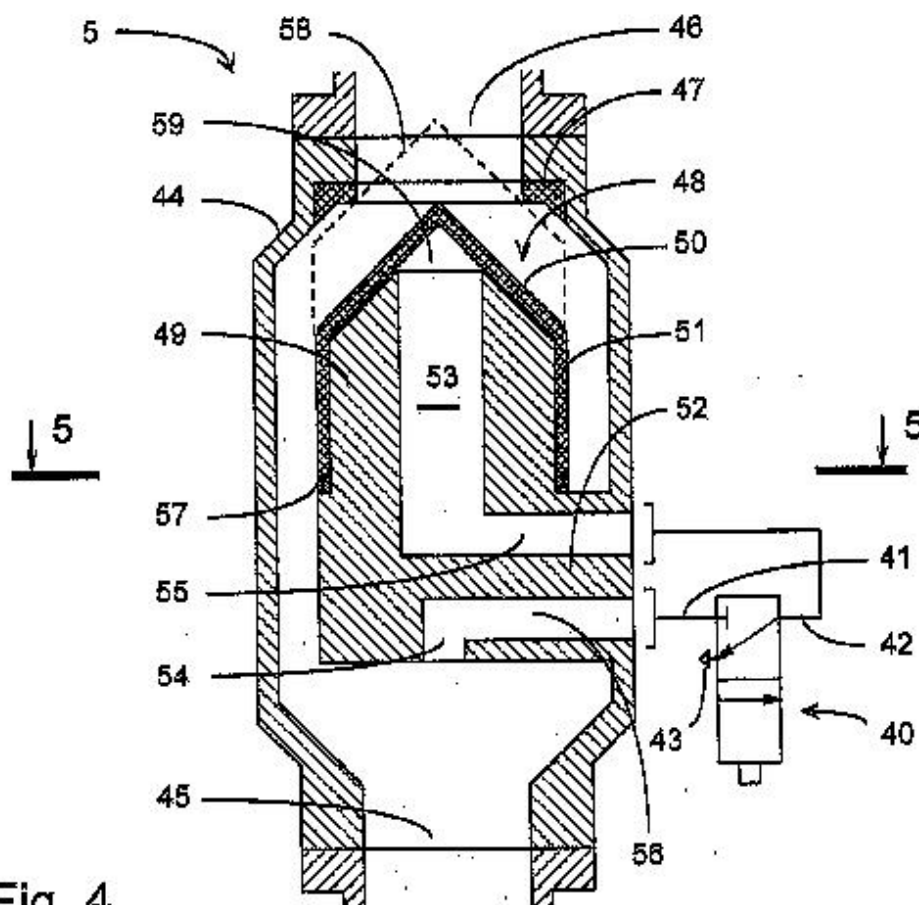


Fig. 4

### References relevant to classification in this group

*This subclass/group does not cover:*

Valves actuated by fluid in general	<a href="#">F16K 31/12</a>
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### F16K 1/14

with ball-shaped valve member (check valves F16K15/04)

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

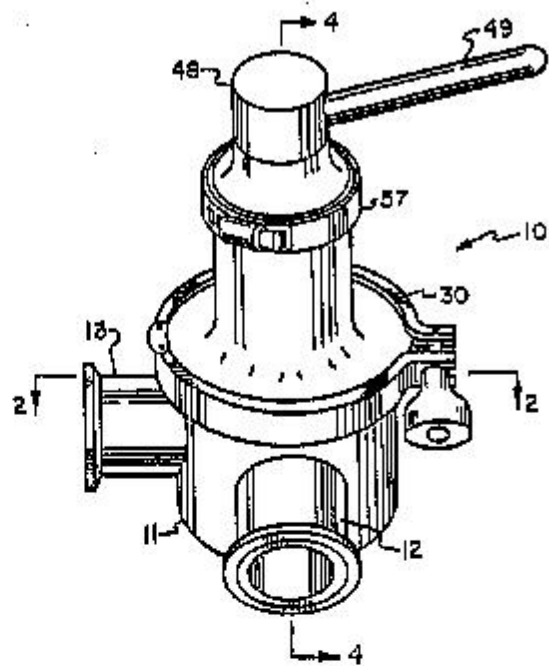


Fig. 1

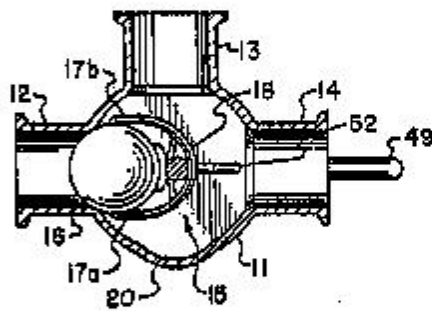


Fig. 2A

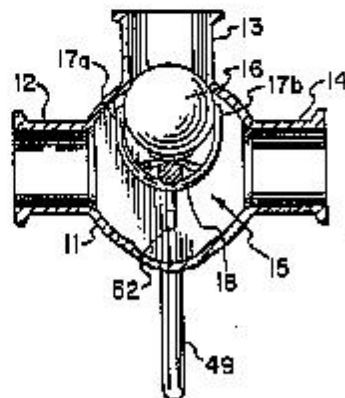


Fig. 2B

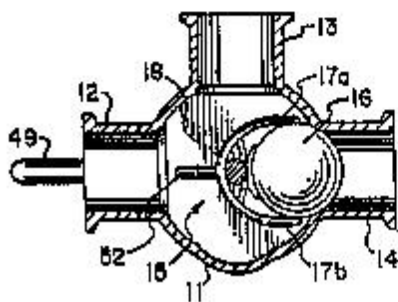


Fig. 2C



## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Check valves	<a href="#">F16K 15/04</a>
Safety/equalising valves	<a href="#">F16K 17/0406</a>
Fluid delivery valves of the self-closing type	<a href="#">F16K 21/08</a>
Venting valves	<a href="#">F16K 24/046</a>

## F16K 1/16

**with pivoted closure-members**

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

**Fig. 1**

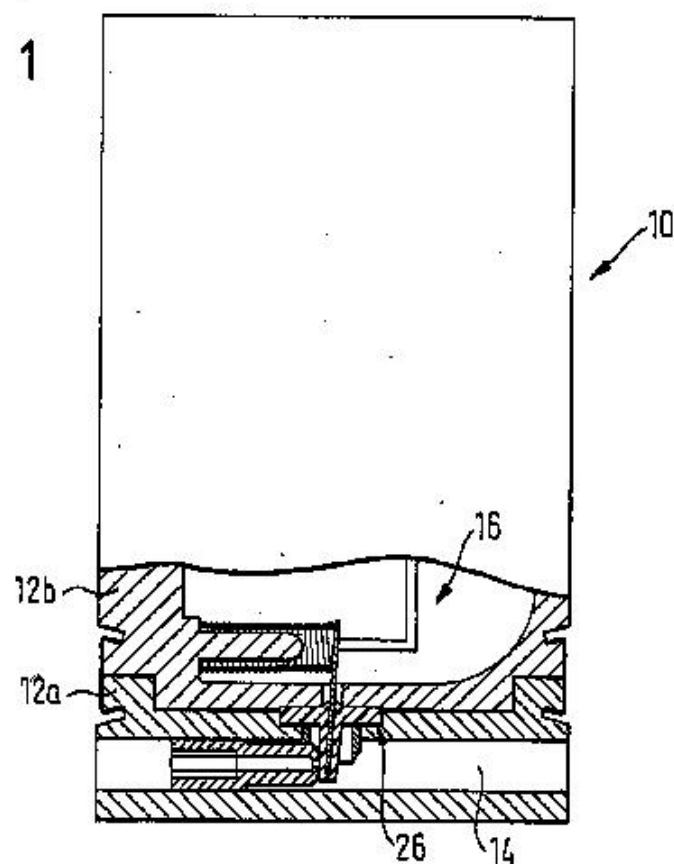
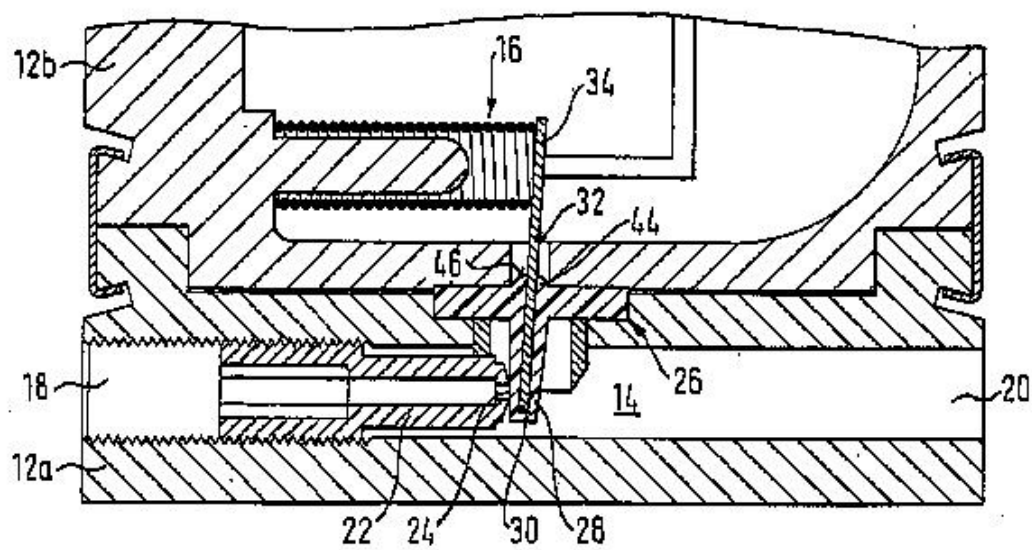


Fig. 2

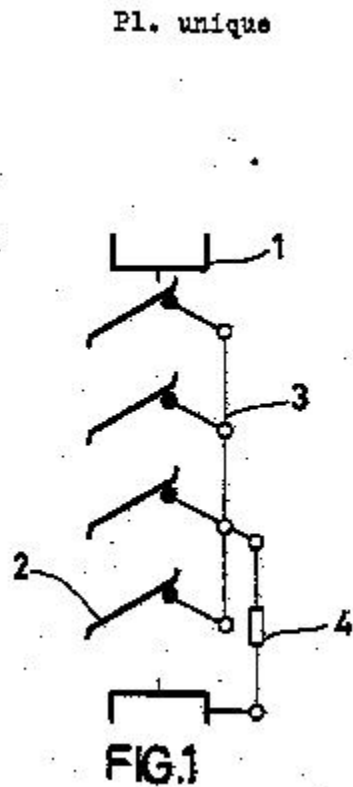


[N: with a plurality of closure members]

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



**F16K 1/18**

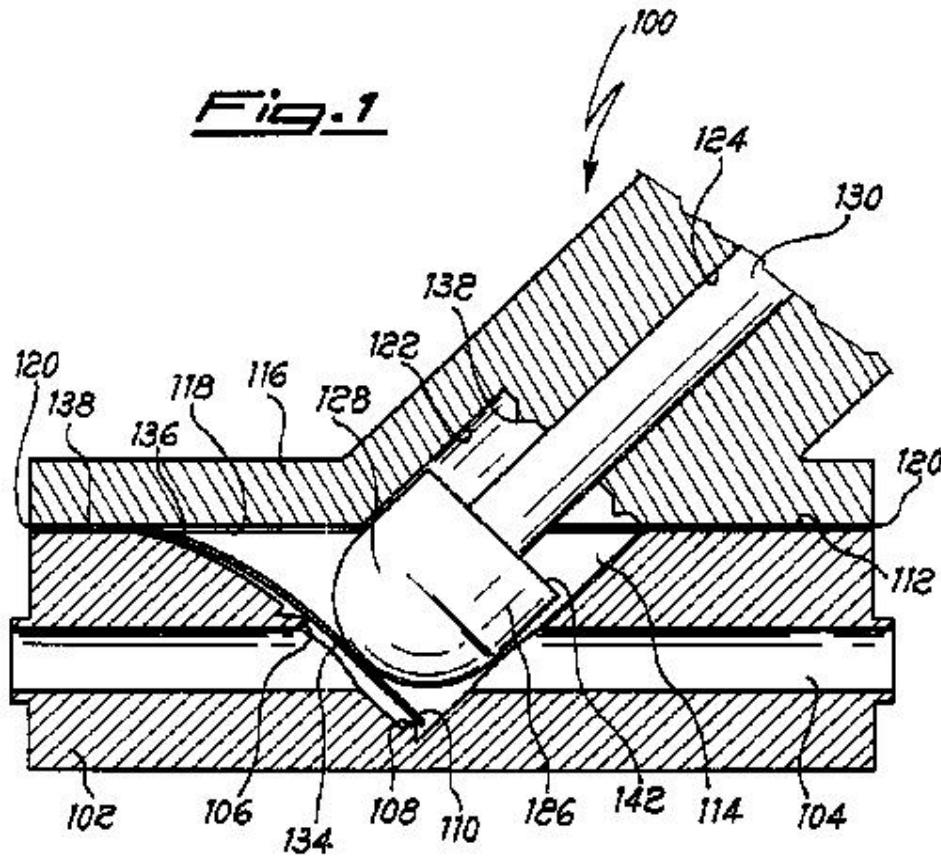
**with pivoted discs or flaps**

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

**Fig. 1**



Il Mandatario:

SOCIETÀ ITALIANA BREVETTI S.p.A.

Dr. Luciano AIMI  
Al. Inscr. Albo 130

with axis of rotation arranged externally of valve member

### Definition statement

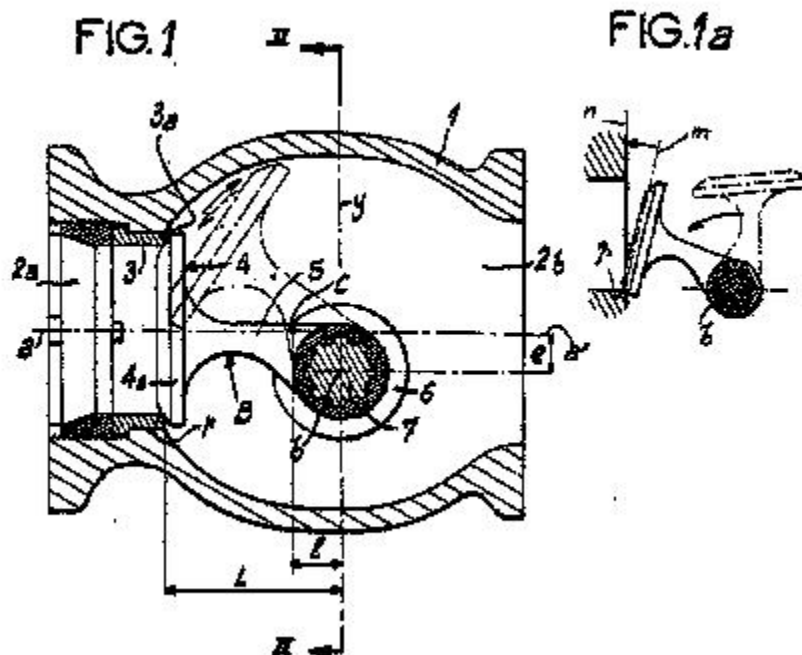
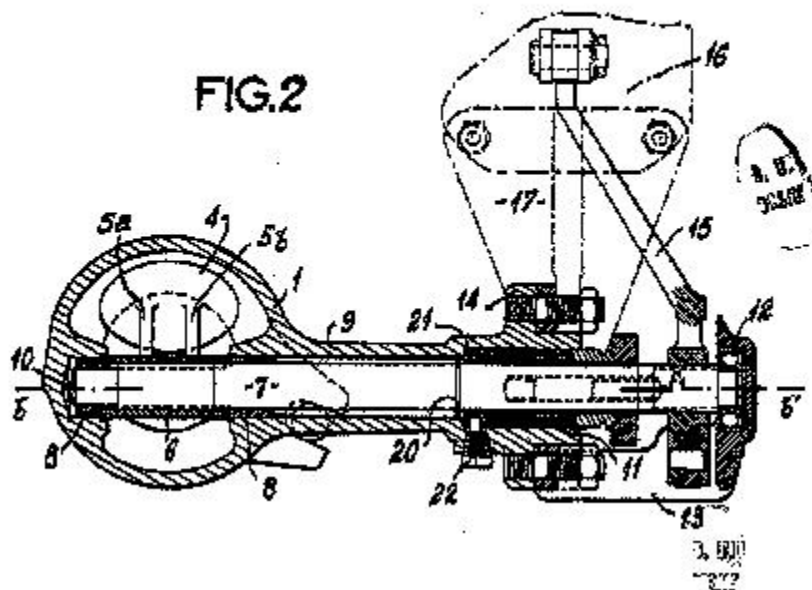
*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

N° 1.821.594

Société Anonyme dite :  
Worthington

2 planches. - Pl. I



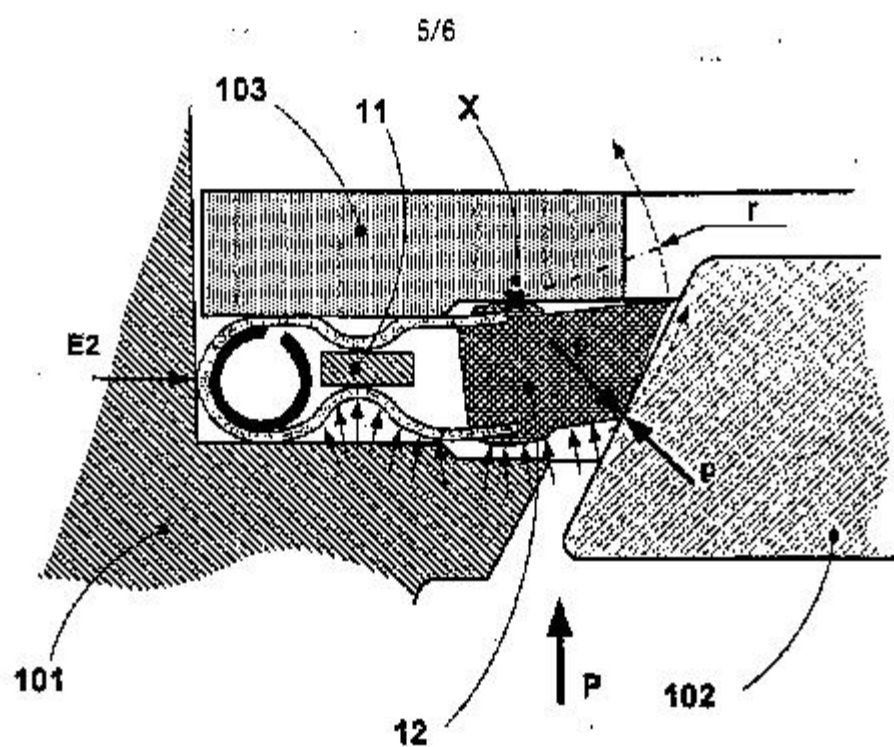
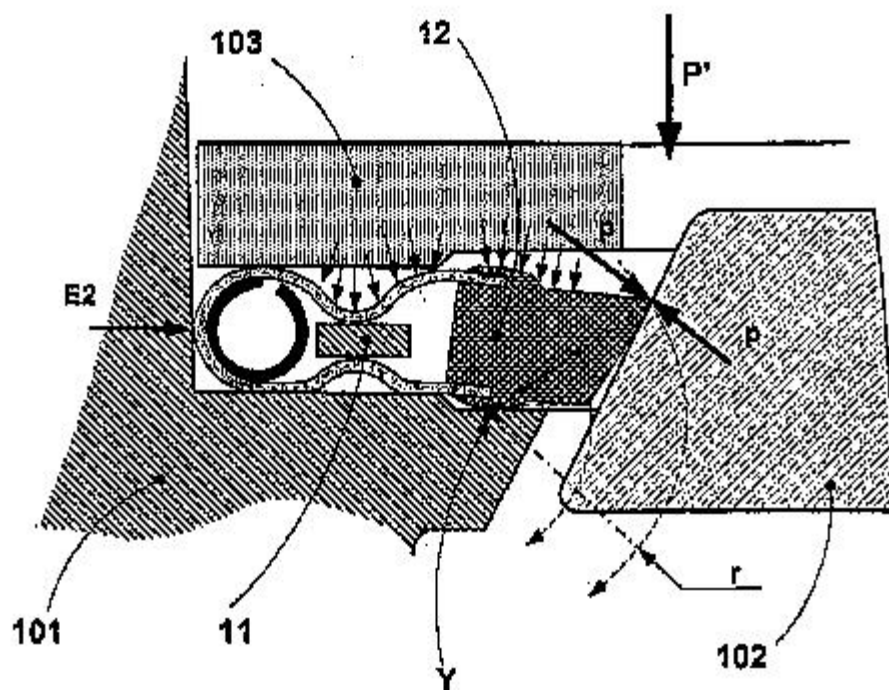
F16K 1/228

## **Movable sealing bodies**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

Figure 10Figure 11

## **F16K 1/2285**

**[N: the movement being caused by the flowing medium]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



2 / 2

Fig. 3

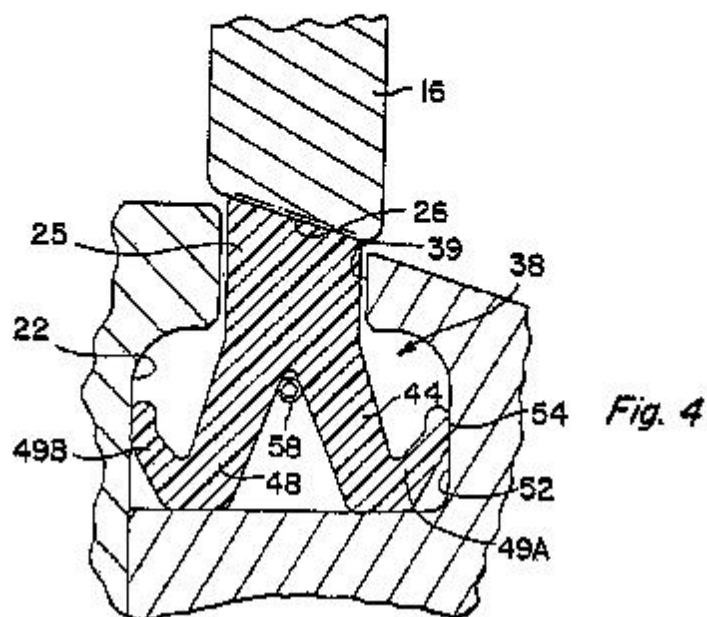
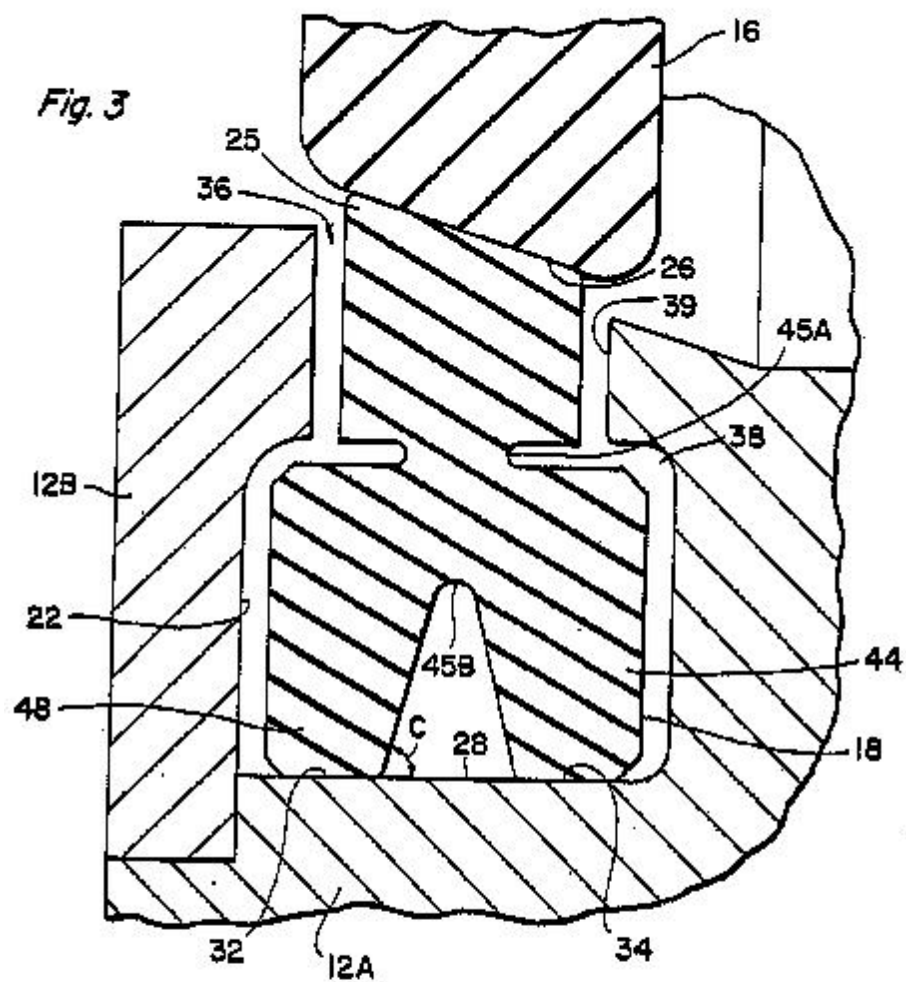


Fig. 4

## **F16K 1/24**

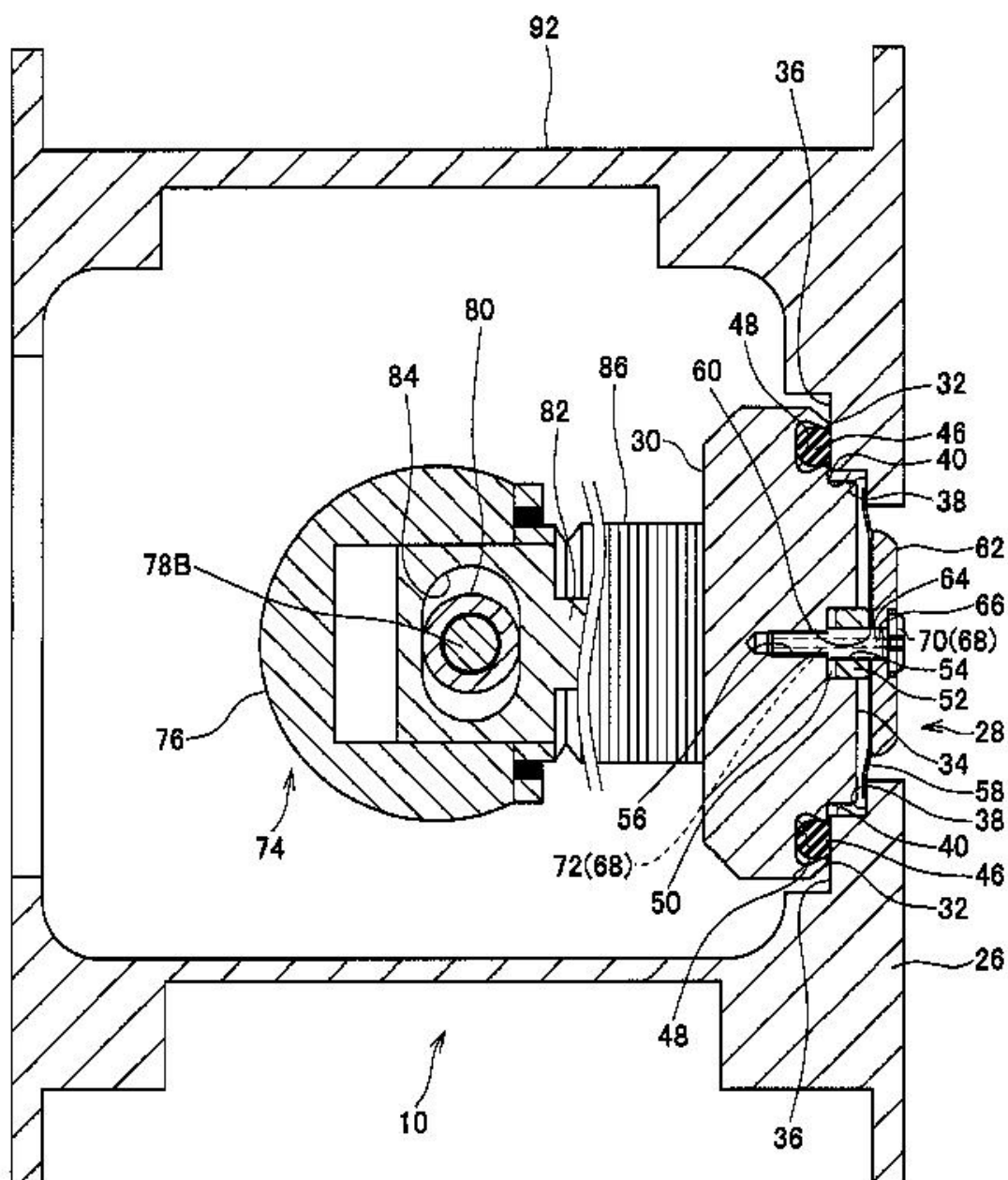
**with valve members that, on opening of the valve, are initially lifted from the seat and next are turned around an axis parallel to the seat**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

[図6]

**F16K 1/30**

specifically adapted for pressure containers

**Definition statement**

*This subclass/group covers:*

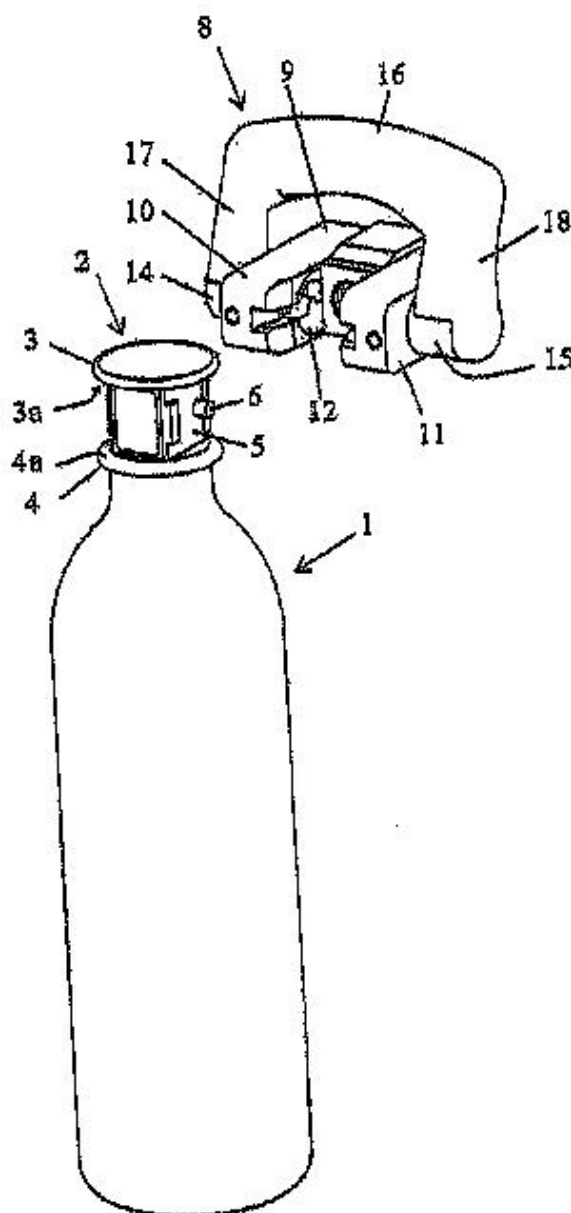
High-pressure valves, generally used in connection with pressure containers. See also [F17C](#) (Gas vessels) and [G05D](#) (Pressure regulators).

Illustrative example:

WO 2009/125180

1/16

PCT/GB2009/000915



### Informative references

Attention is drawn to the following places, which may be of interest for search:

Connectors used in connection with pressure containers / the connectors comprising valves	<a href="#">F16L 37/28</a>
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## **F16K 1/301**

**[N: only shut-off valves, i.e. valves without additional means]**

### **Definition statement**

*This subclass/group covers:*

Valves used for opening/closing the flow path, without other functions (e.g. regulation) or other valves on the same valve body (e.g. safety valves).

## **F16K 1/302**

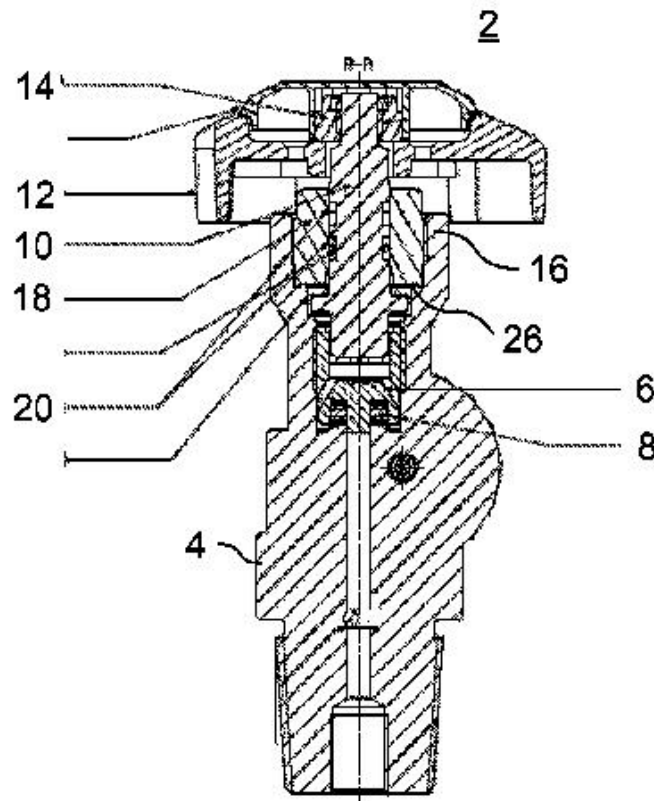
**[N: with valve member and actuator on the same side of the seat]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

FIG 1

**F16K 1/303**

[N: with a valve member, e.g. stem or shaft, passing through the seat]

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

1 / 1

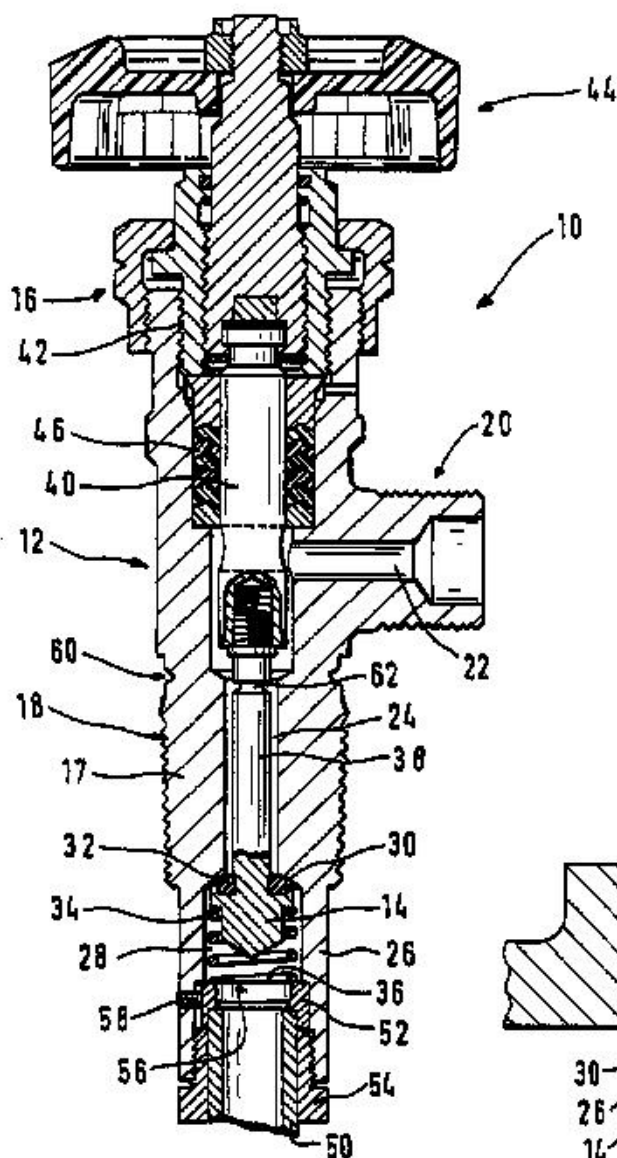


Fig. 1

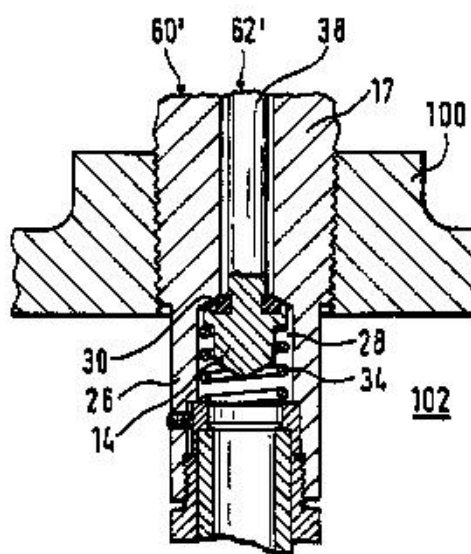


Fig. 2

## F16K 1/304

[N: Shut-off valves with additional means]

### Glossary of terms

*In this subclass/group, the following terms (or expressions) are used with the meaning indicated:*

Additional means	Valves or devices, used for other functional purposes than only opening/closing the valve (e.g. regulation, safety, monitoring).
------------------	--

## F16K 1/307

**[N: Additional means used in combination with the main valve]**

### References relevant to classification in this group

*This subclass/group does not cover:*

Flow regulation	<a href="#">G05D</a>
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### Special rules of classification within this group

The application focuses on the "other" functions of the main valve.

### Glossary of terms

*In this subclass/group, the following terms (or expressions) are used with the meaning indicated:*

Additional means	Valves or devices, used for other functional purposes than only opening/closing the valve (e.g. regulation, safety, monitoring).
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## F16K 1/308

**[N: Connecting means]**

### Definition statement

*This subclass/group covers:*

Details of the (permanent) connection of the valve to the container.

### References relevant to classification in this group

*This subclass/group does not cover:*

Connectors per se (quick connectors)	<a href="#">F16L 37/28</a>
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with valves)	
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## **F16K 1/32**

**Details (details of more general applicability F16K25/00 to F16K51/00)**

### **Definition statement**

*This subclass/group covers:*

Details (e.g. shape, materials, function) of valve members, seats, attaching members to spindles, preventing rotation, additional adjustment (with additional means) of the flow and other arrangements of the valve member for modifying the rate of flow (see sub-classes).

## **F16K 1/34**

**Cutting-off parts, e.g. valve members, seats (F16K1/06, F16K1/12, F16K1/14, F16K1/26 take precedence)**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

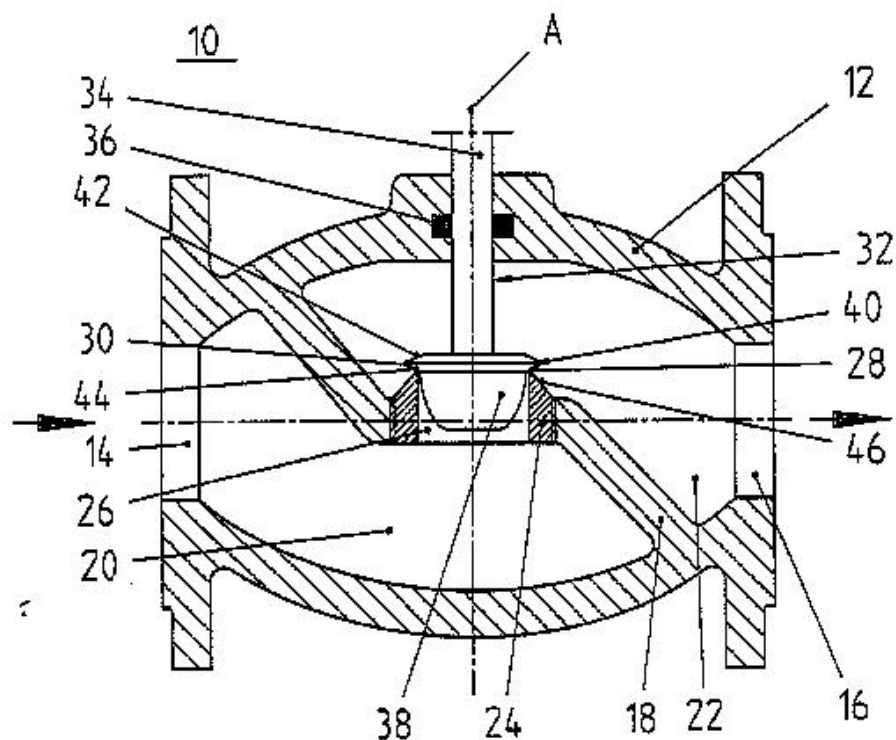


Fig. 1

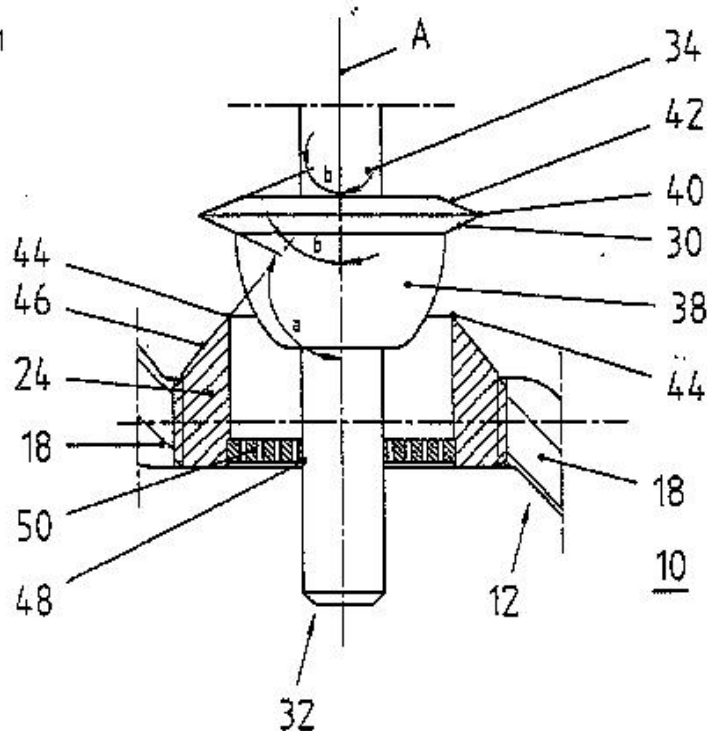


Fig. 2

702 046/218

## F16K 1/385

[N: contacting in the closed position, over a substantial axial

**length, a seat surface having the same inclination]**

**Definition statement**

*This subclass/group covers:*

E.g. "needle" valves.

**F16K 1/443**

**[N: the seats being in series]**

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

FIG 3E

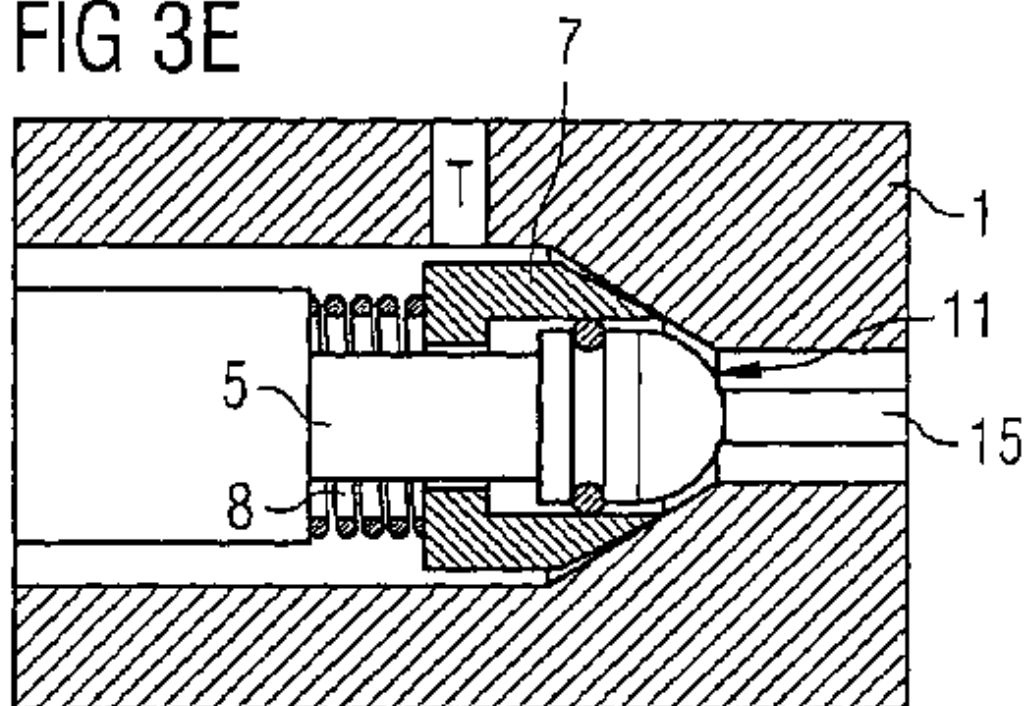
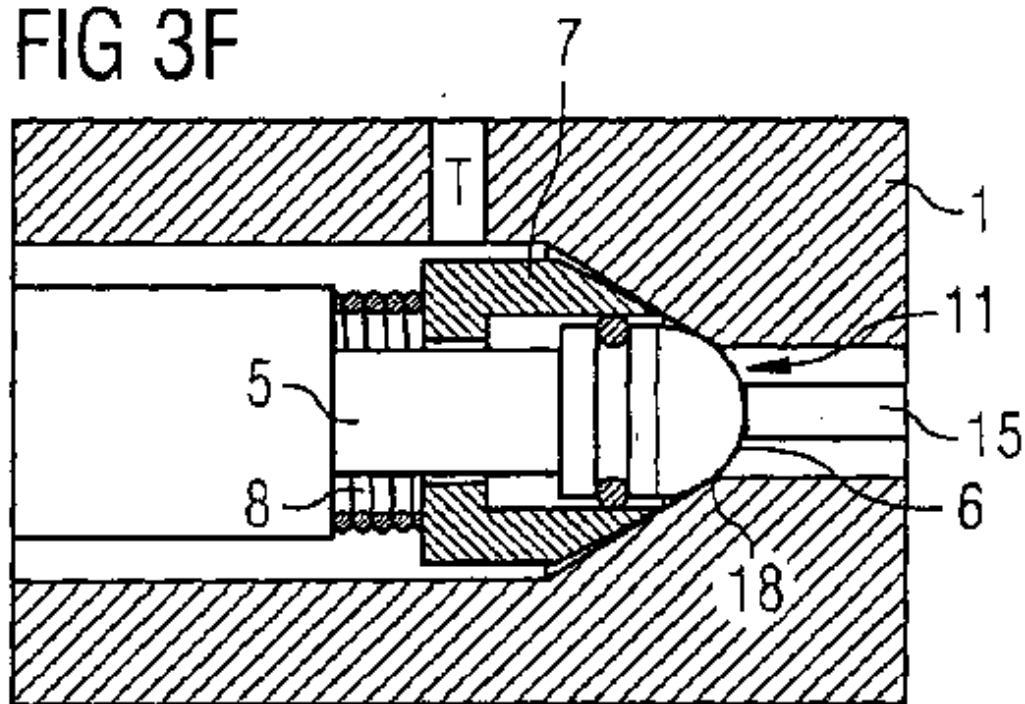


FIG 3F



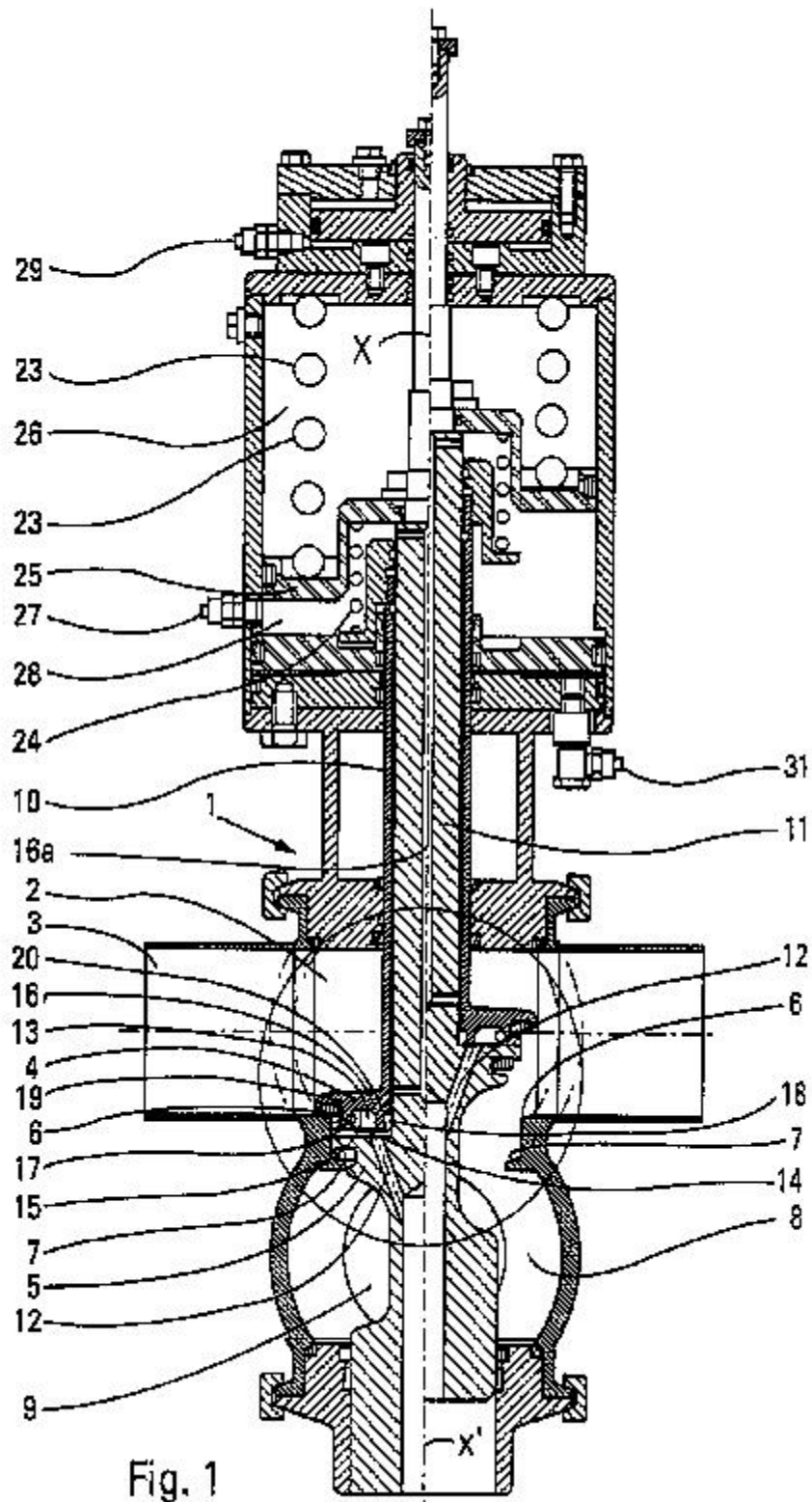
## **F16K 1/446**

**[N: with additional cleaning or venting means between the two seats]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

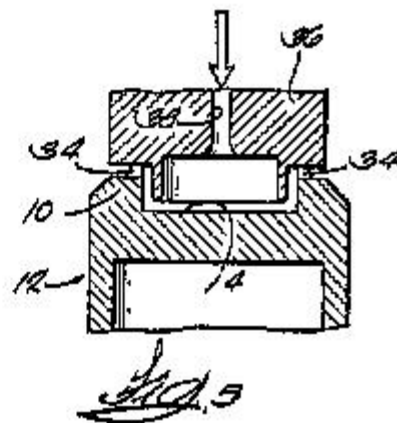
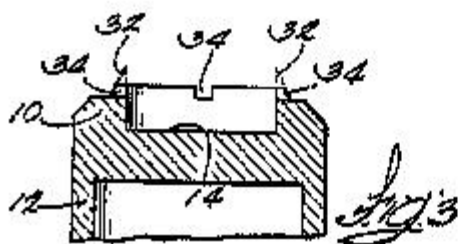
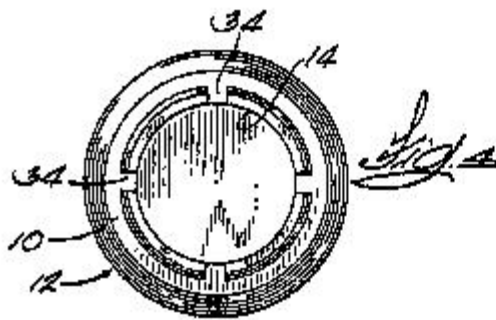
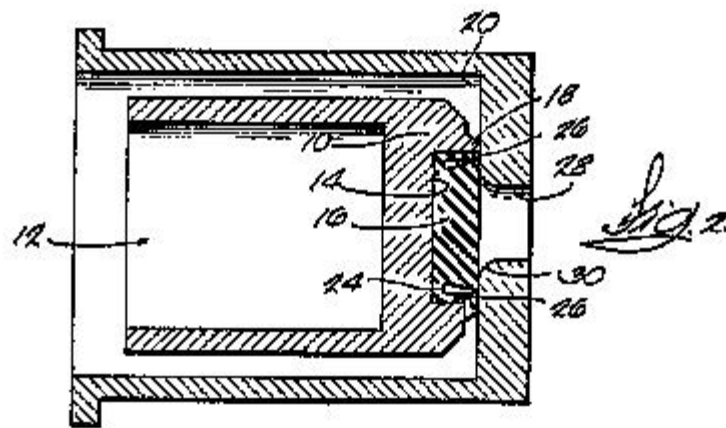
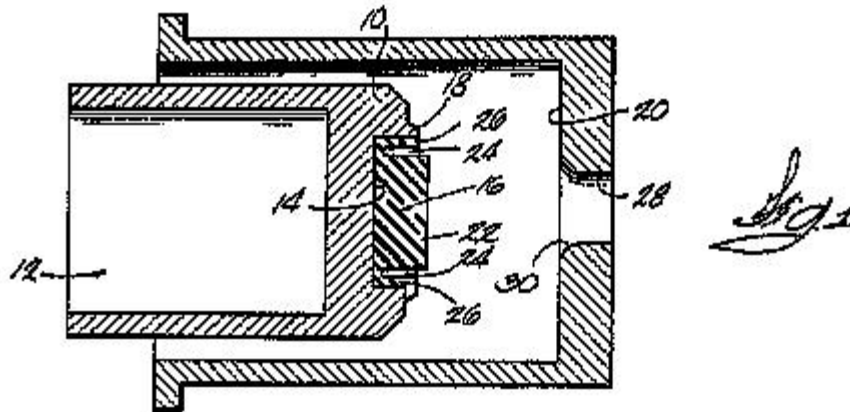


## **Attachment of sealing rings**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.





## F16K 1/48

### Attaching valve members to screw-spindles

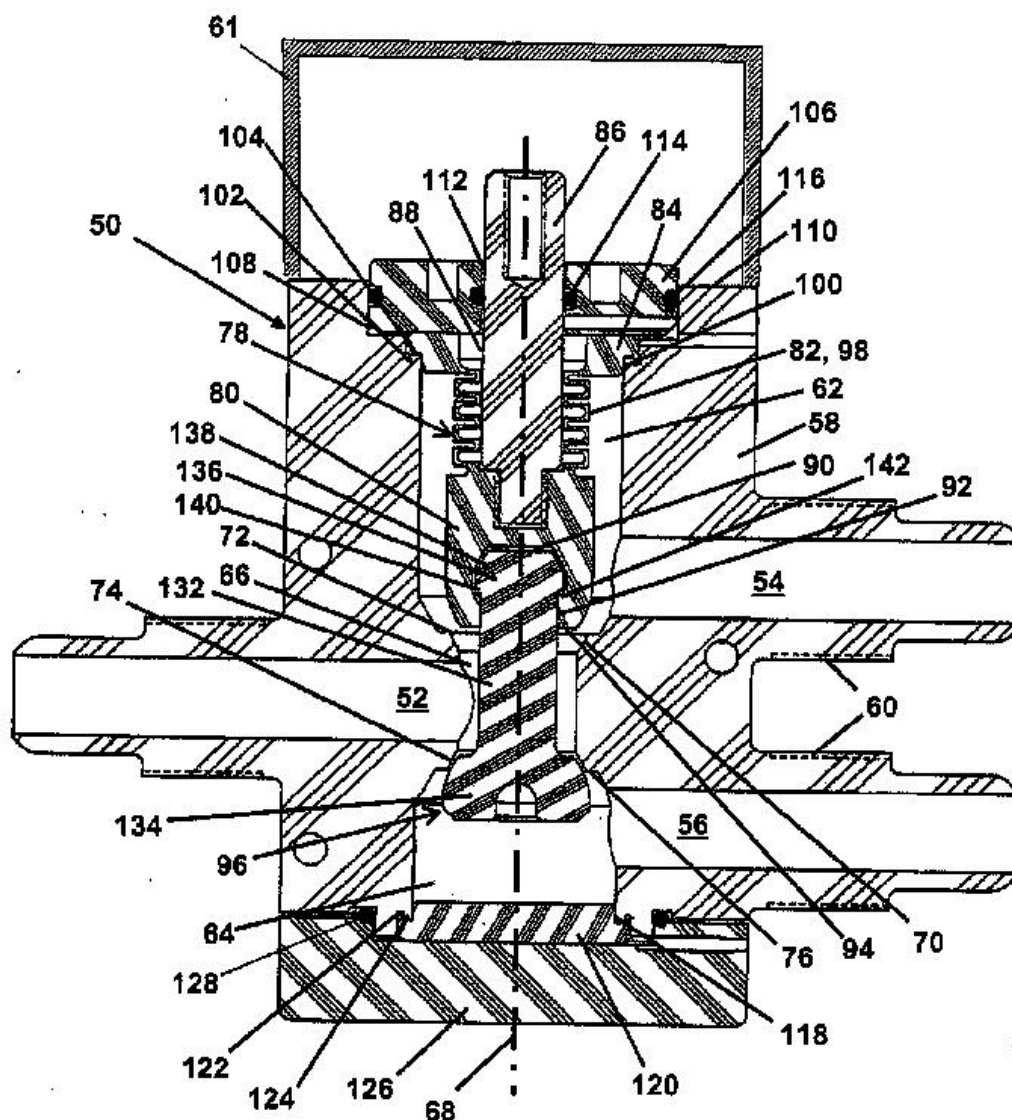
#### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

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US 2007/0251588 A1



## F16K 1/50

### Preventing rotation of valve members

#### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

WO 00/20145

PCT/DK98/00429

3/3

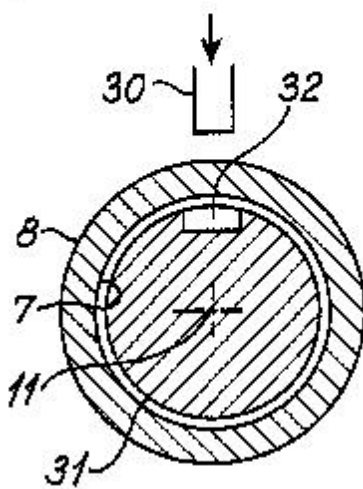


Fig. 3a

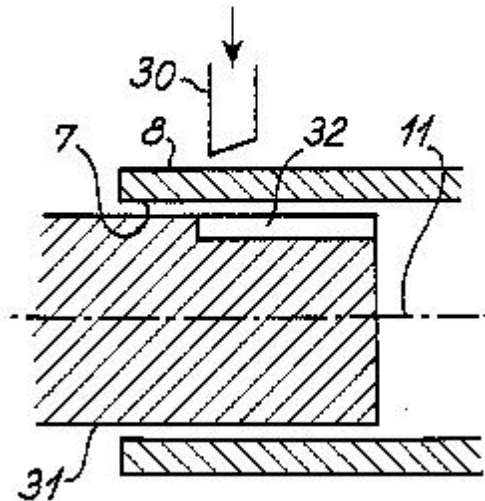


Fig. 3b

## F16K 1/52

**Means for additional adjustment of the rate of flow**

### Definition statement

*This subclass/group covers:*

Additional means for adjusting the rate of flow in combination with the cutting-off parts.

## F16K 1/54

**Arrangements for modifying the way in which the rate of flow varies during the actuation of the valve**

### Definition statement

*This subclass/group covers:*

Only the valve member modifies the flow during the actuation of the valve.

Illustrative example:

FIG 1

1/1

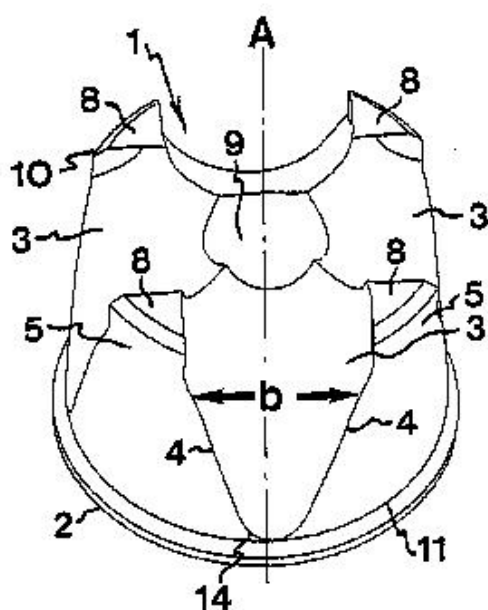
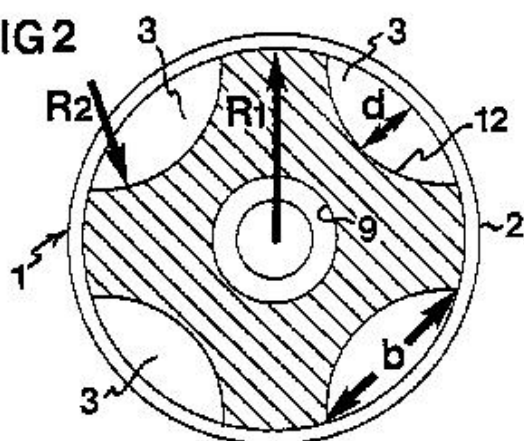
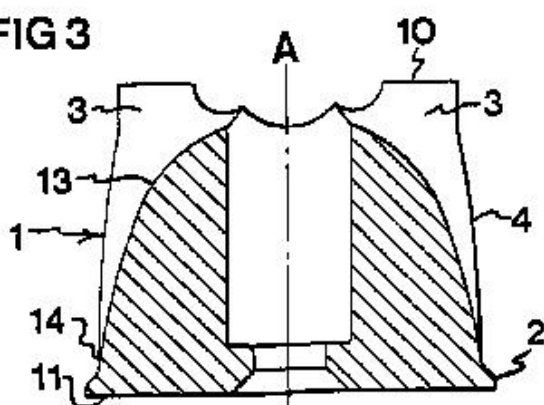


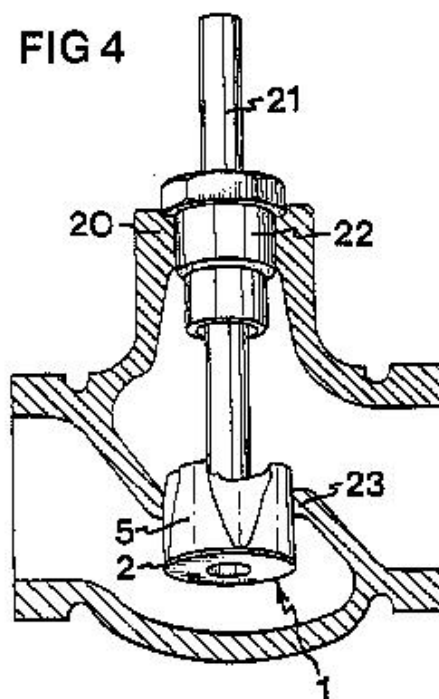
FIG 2



**FIG 3**



**FIG 4**

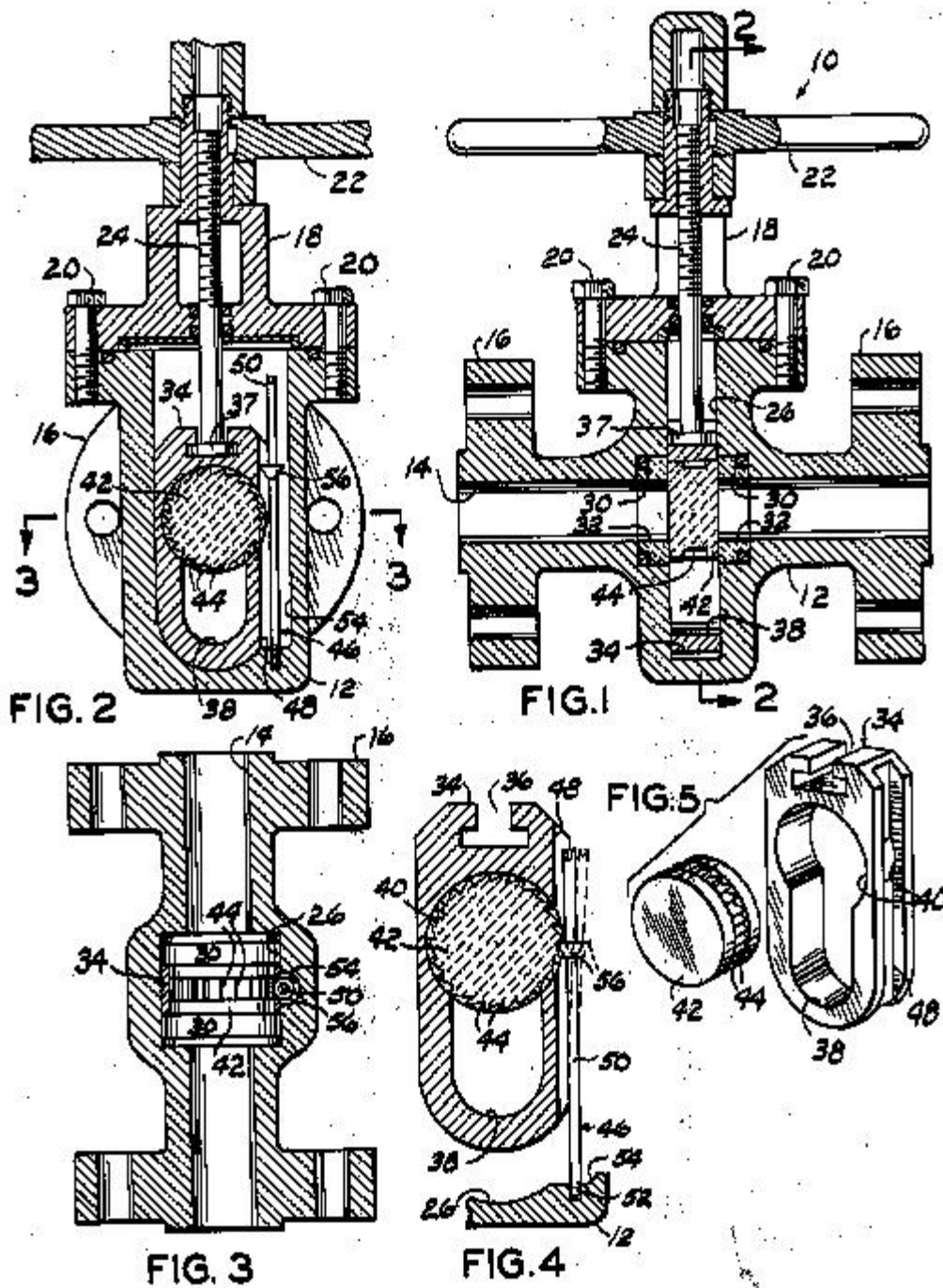


**Gate valves or sliding valves, i.e. cut-off apparatus with closing members having a sliding movement along the seat for opening and closing (F16K5/00 takes precedence; in barrages or weirs E02B8/04)**

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



F16K 3/0245

[N: Curtain gate valves]

Definition statement



*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

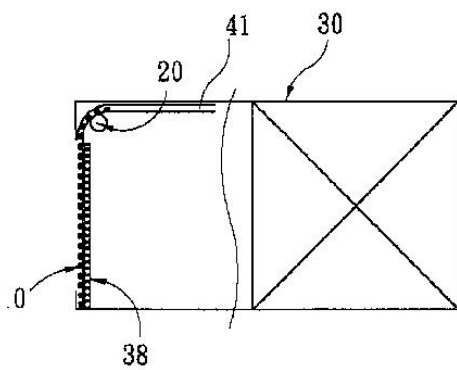


FIG. 9

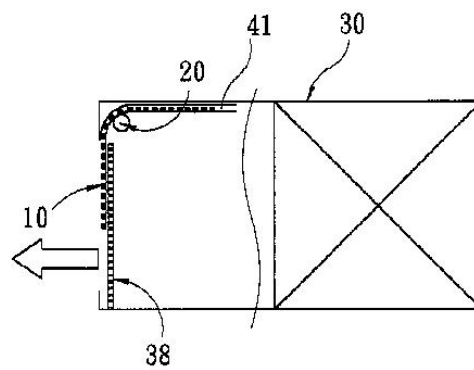


FIG. 10

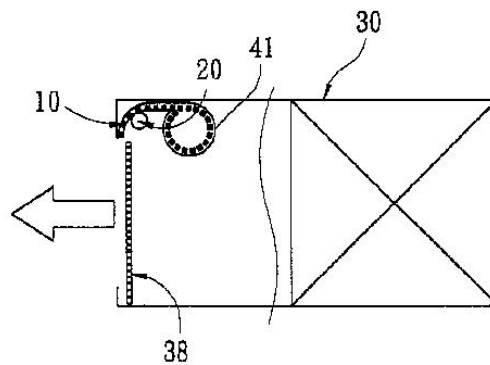


FIG. 11

## F16K 3/0281

[N: Guillotine or blade-type valves, e.g. no passage through the valve member]

### Definition statement

*This subclass/group covers:*

Blade-type: no through-hole is present in the valve member.

Illustrative example:

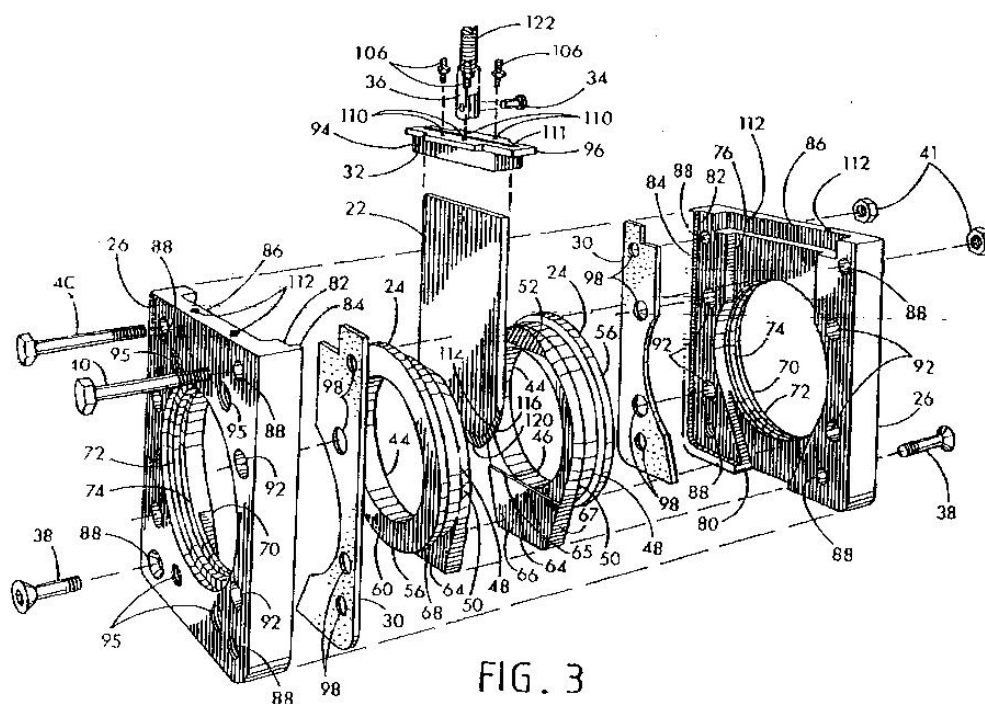


FIG. 3

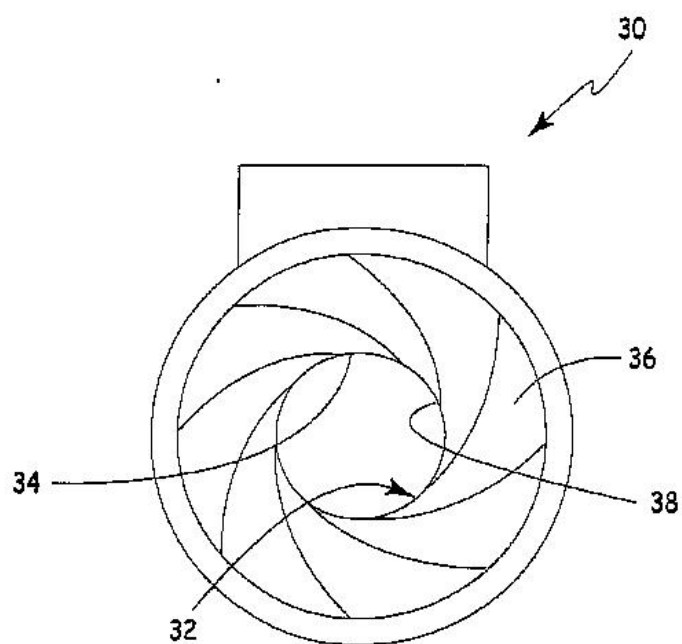
## F16K 3/03

with a closure member in the form of an iris-diaphragm

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

**FIG. 2B****F16K 3/08**

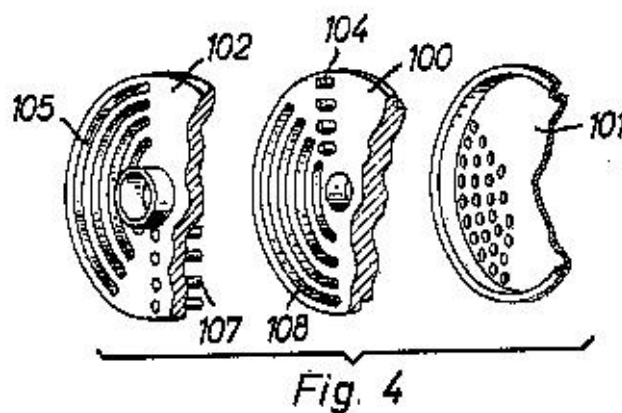
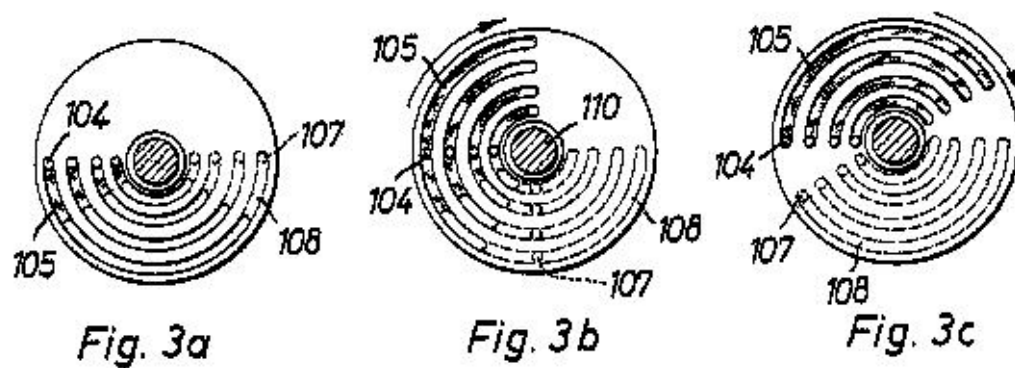
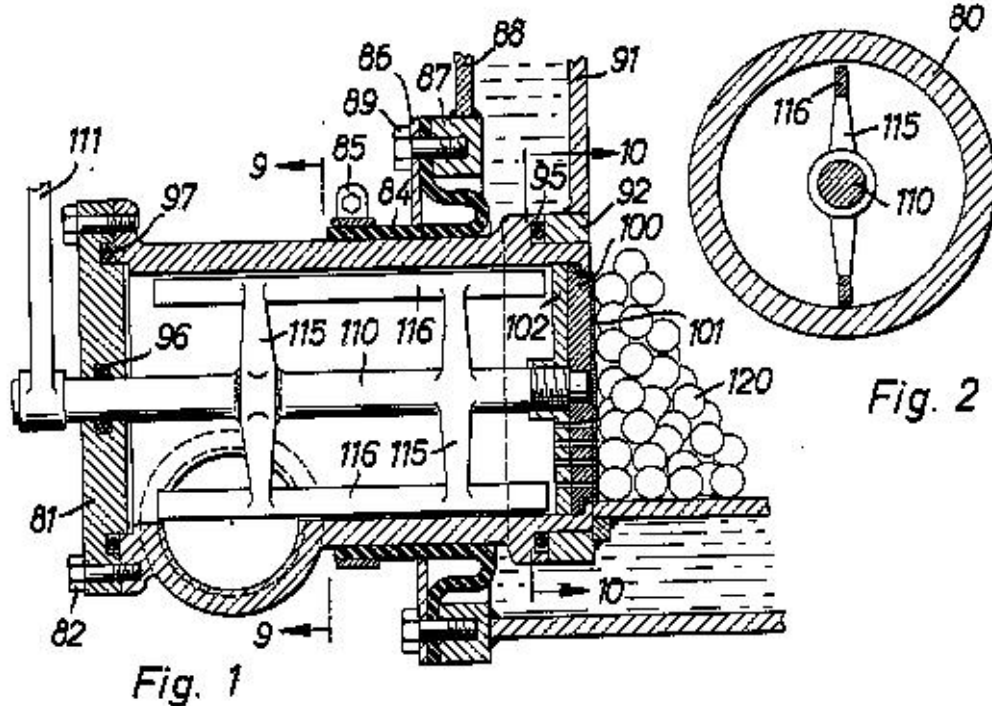
**with circular plates rotatable around their centres**

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



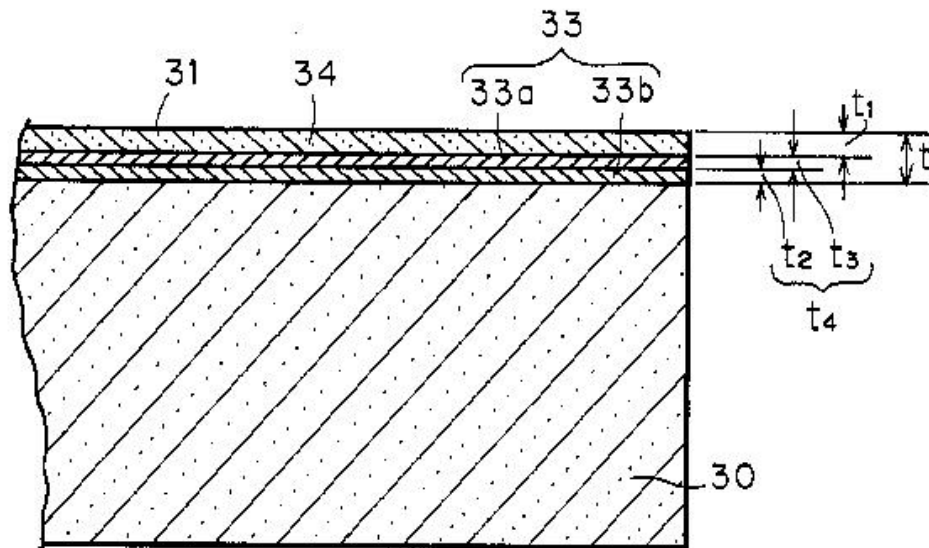
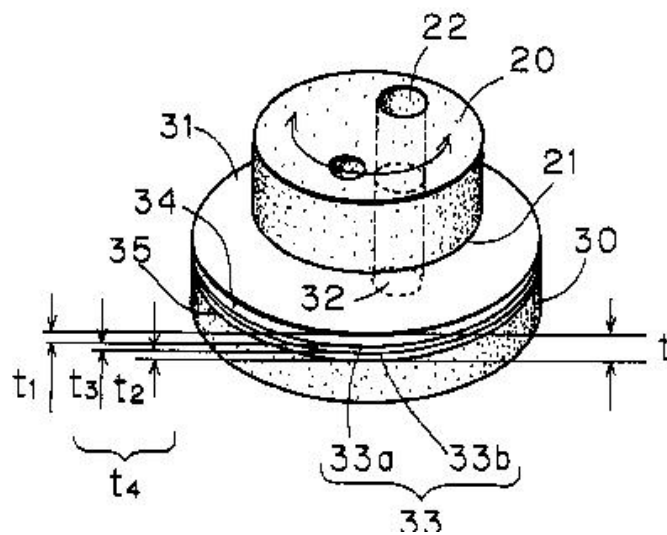


**[N: the axis of supply passage and the axis of discharge passage being coaxial and parallel to the axis of rotation of the plates]**

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

*Fig. 1**Fig. 2***F16K 3/10**

with special arrangements for separating the sealing faces or for pressing them together

Illustrative example of subject matter classified in this group.

US 2007/0138424 A1



## F16K 3/12

with wedge-shaped arrangements of sealing faces

### Definition statement

*This subclass/group covers:*

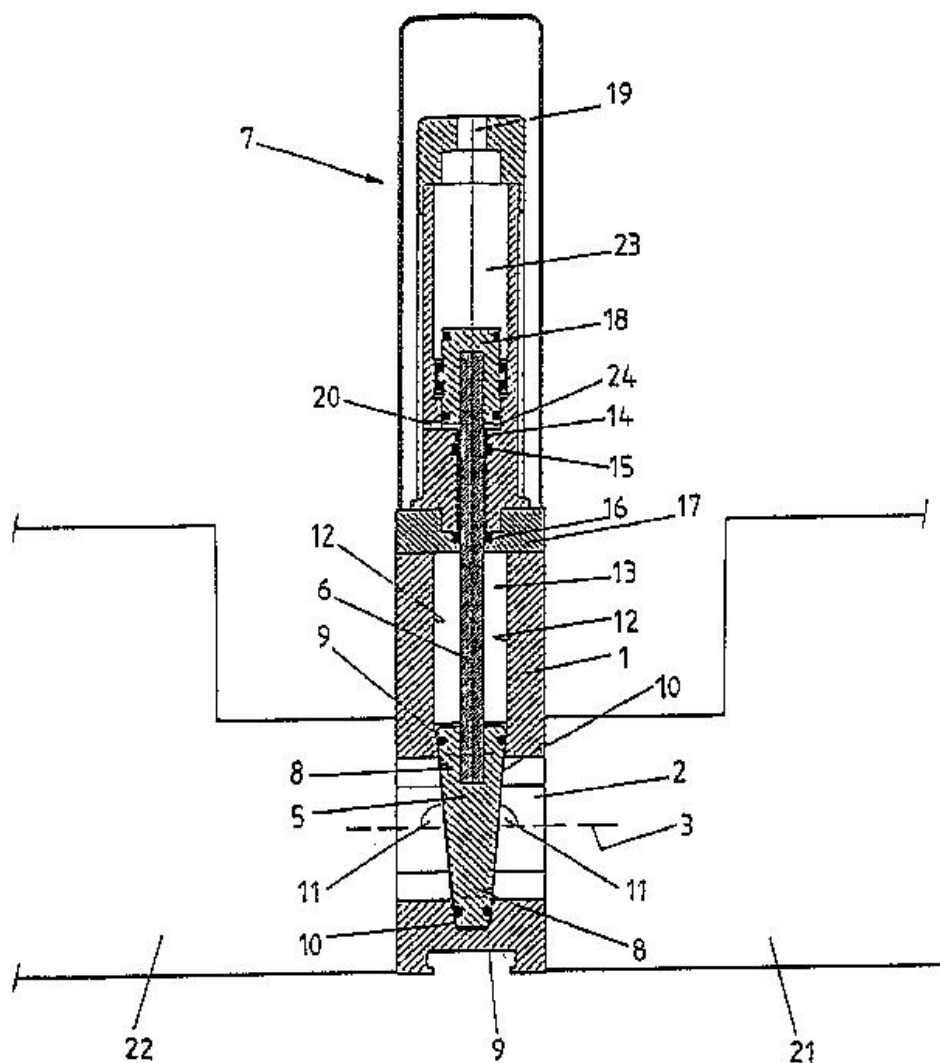
Illustrative example of subject matter classified in this group.

**U.S. Patent**

Apr. 9, 2002

Sheet 2 of 4

**US 6,367,770 B1**



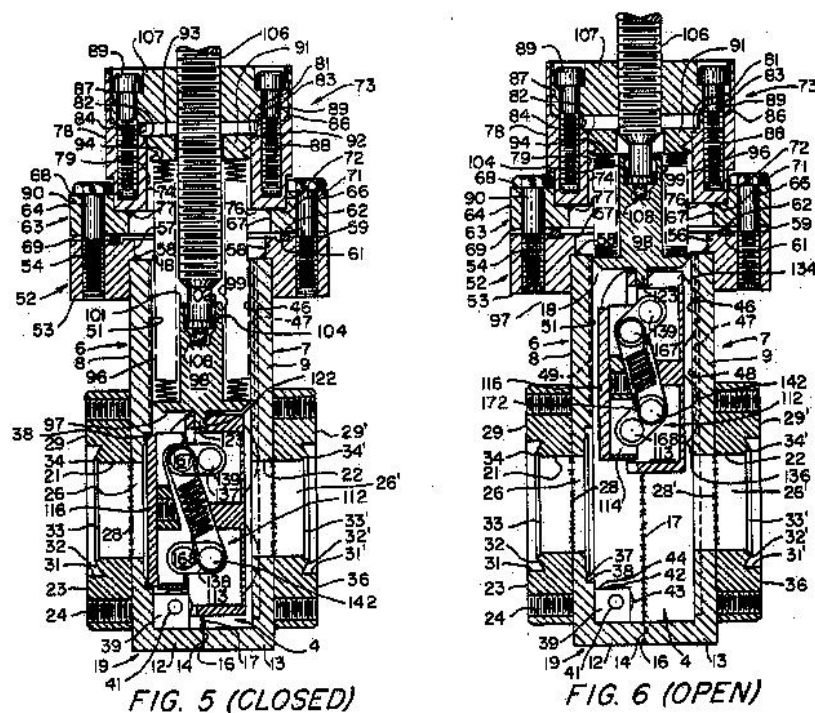
## F16K 3/182

[N: by means of toggle links]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



## F16K 3/184

[N: by means of cams]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



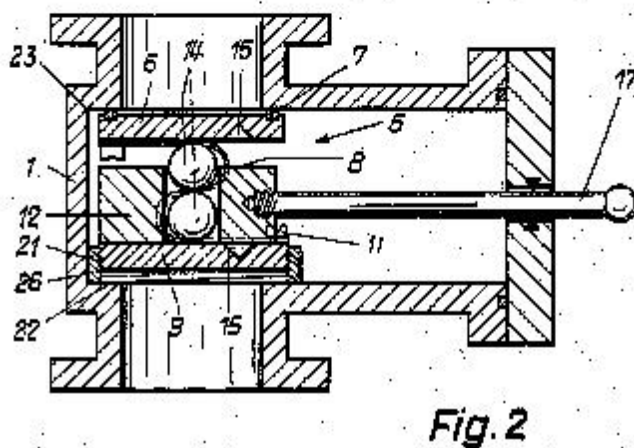
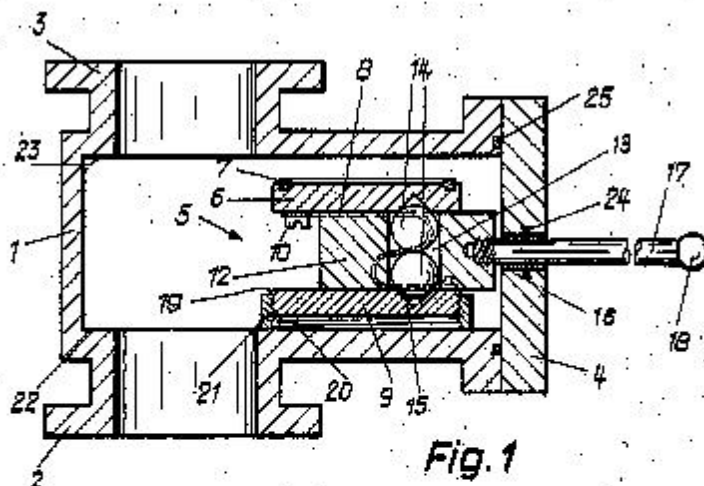
Feb. 13, 1968

S. SCHERTLER

3,368,792

GATE STOP VALVE

Filed Feb. 16, 1966



## F16K 3/188

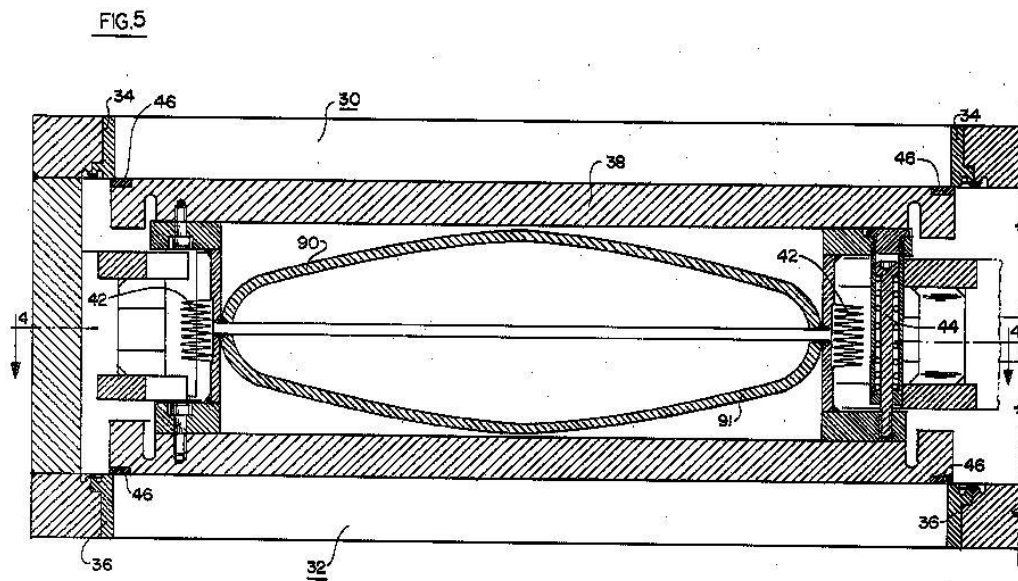
[N: by means of hydraulic forces]

### Definition statement

*This subclass/group covers:*

The closure members are pushed towards the seats by hydraulic forces.

Illustrative example:



## References relevant to classification in this group

*This subclass/group does not cover:*

Fluid actuation of the valve	<a href="#">F16K 31/12</a>
------------------------------	----------------------------

## F16K 3/202

[N: by movement of toggle links]

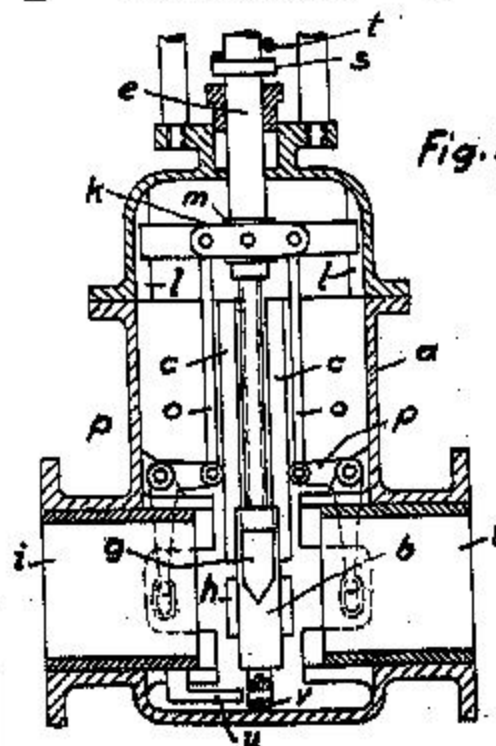
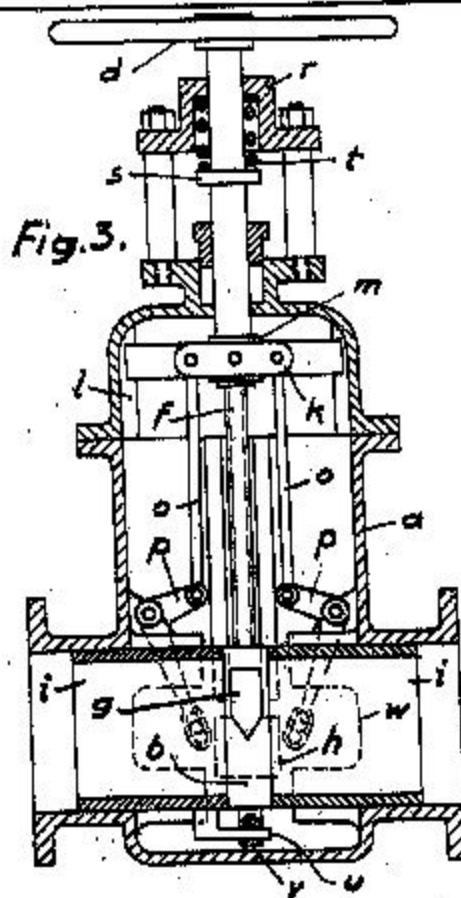
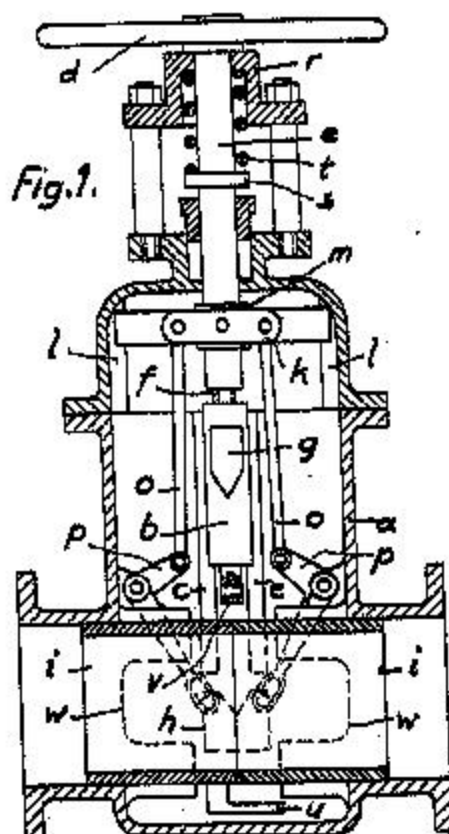
## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



[This Drawing is a reproduction of the Original on a reduced scale.]



Charles & Read Ltd. Photo Litho.

**[N: by means of hydraulic forces]**

**Definition statement**

*This subclass/group covers:*

The seat members are pushed towards valve members by hydraulic forces.

**References relevant to classification in this group**

*This subclass/group does not cover:*

Fluid actuation of the valve	<a href="#">F16K 31/12</a>
------------------------------	----------------------------

**F16K 3/22**

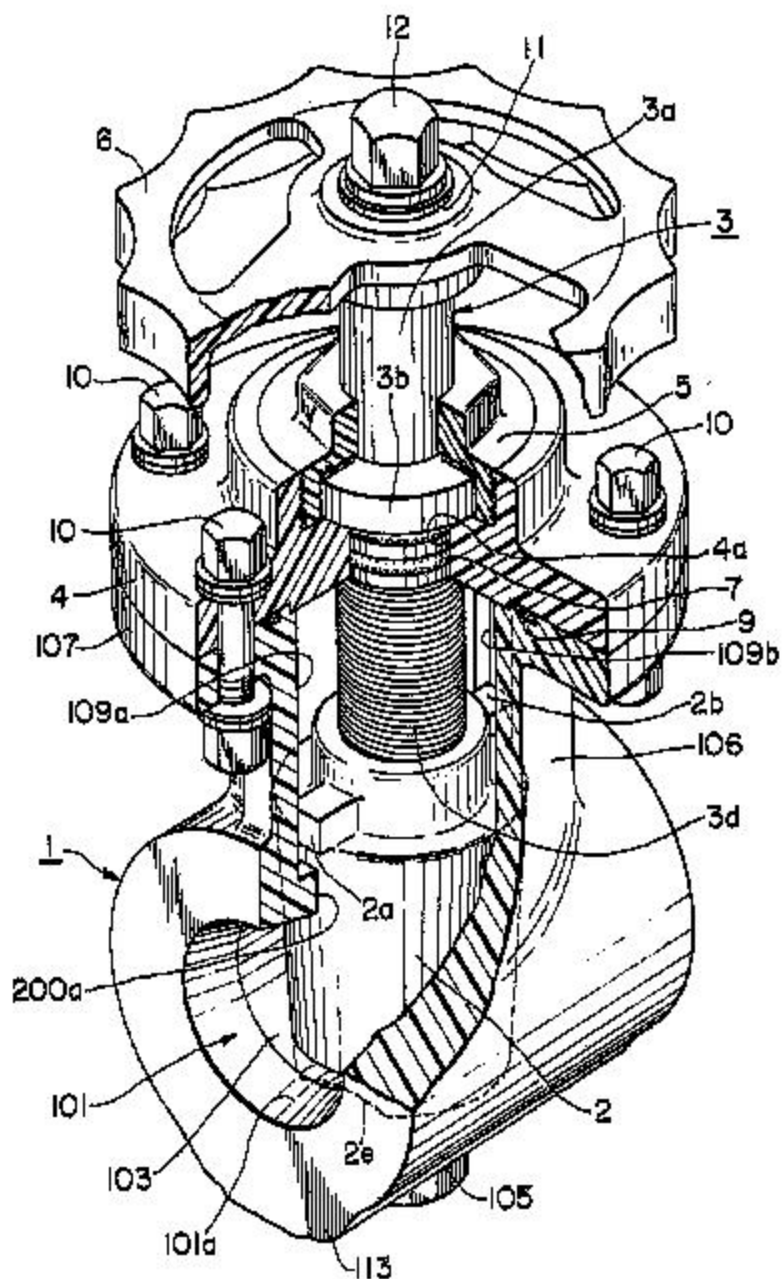
**with sealing faces shaped as surfaces of solids of revolution  
(F16K13/02 takes precedence; with resilient valve members  
F16K3/28)**

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

FIG. 3



### References relevant to classification in this group

*This subclass/group does not cover:*

Taps and cocks	<a href="#">F16K 5/00</a>
Multiple-way (e.g. more than two) sliding valves with sealing faces shaped as surfaces of solids of revolution	<a href="#">F16K 11/00</a>

## **F16K 3/243**

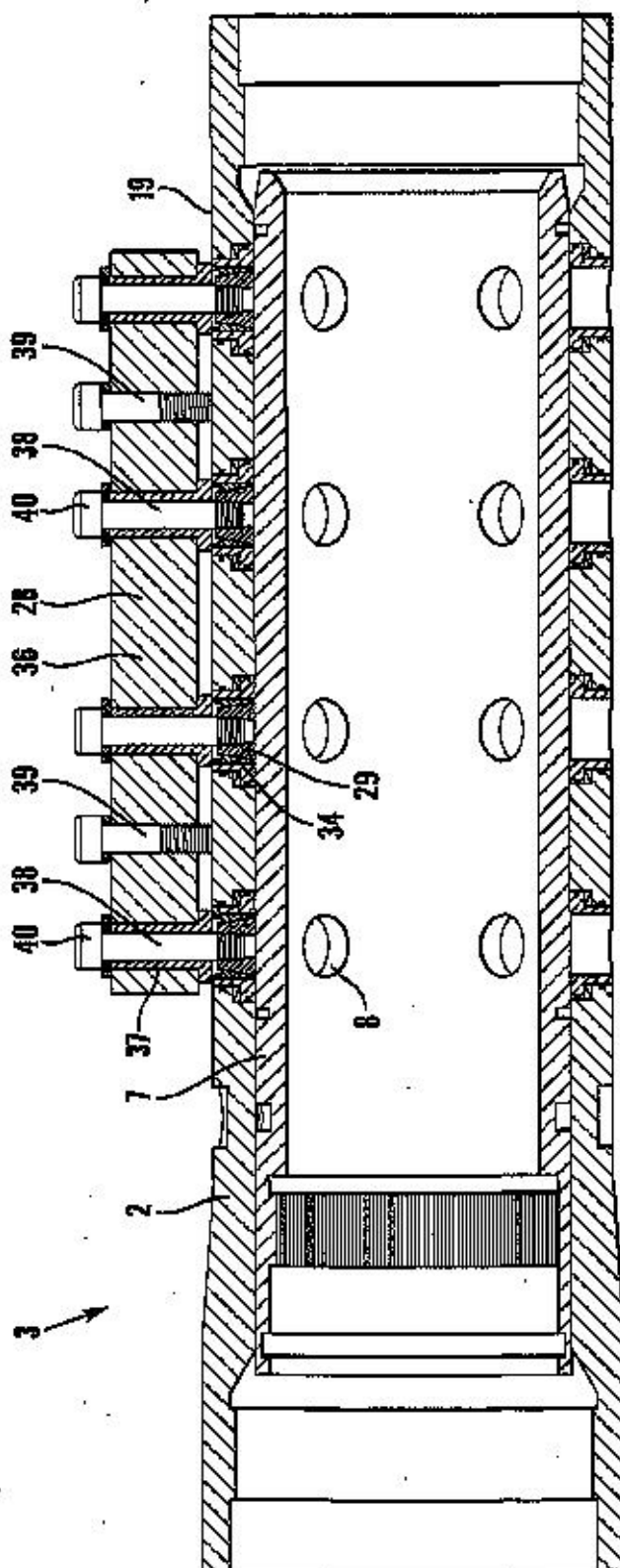
**[N: Packings (F16K3/246 takes precedence)]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

**6/7**



**Fig. 7**

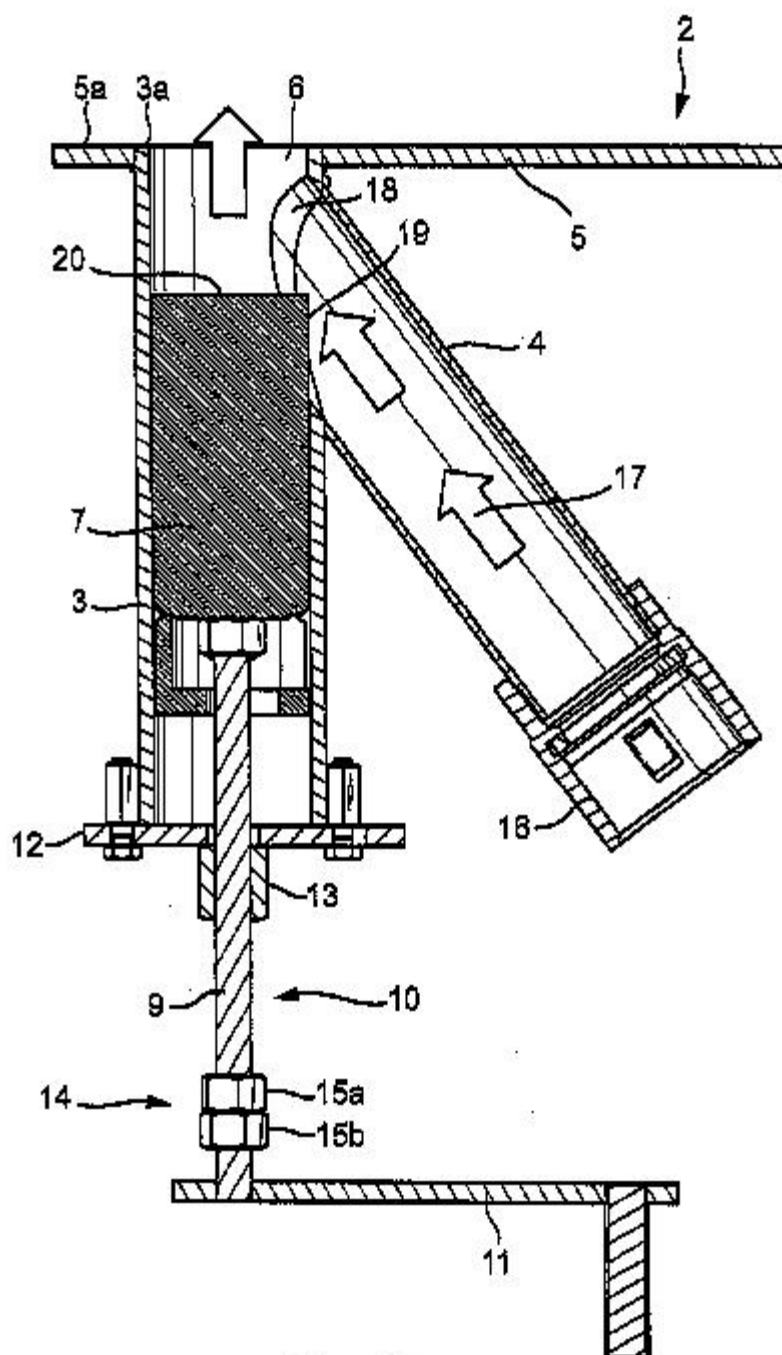
## **F16K 3/246**

**[N: Combination of a sliding valve and a lift valve]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



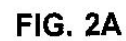
**Fig. 2B**

**F16K 3/26**

**with fluid passages in the valve member**

**6,039,065**

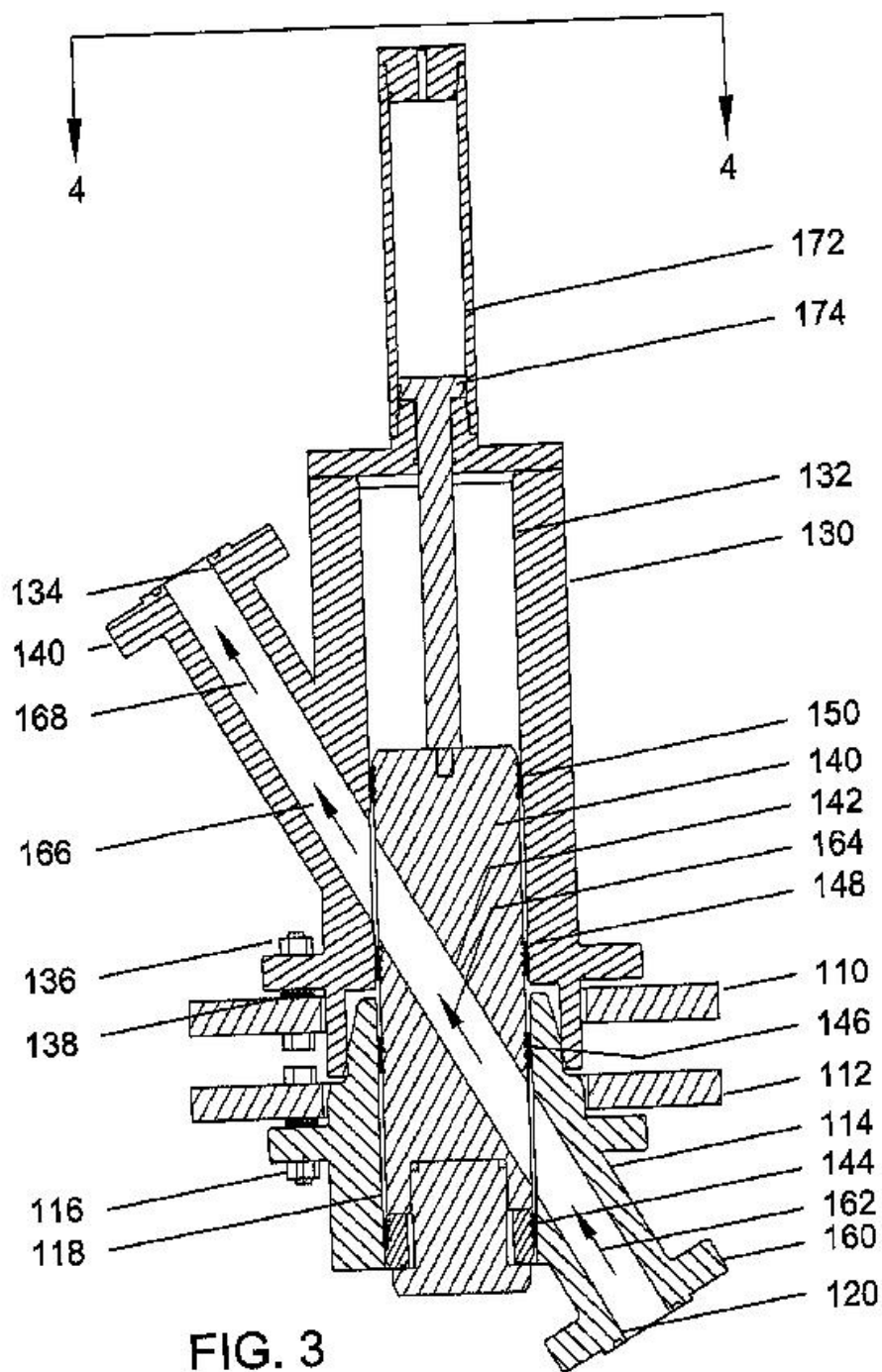
Illustrative example of subject matter classified in this group.



**[N: with a transverse bore in the valve member]**

Illustrative example of subject matter classified in this group.





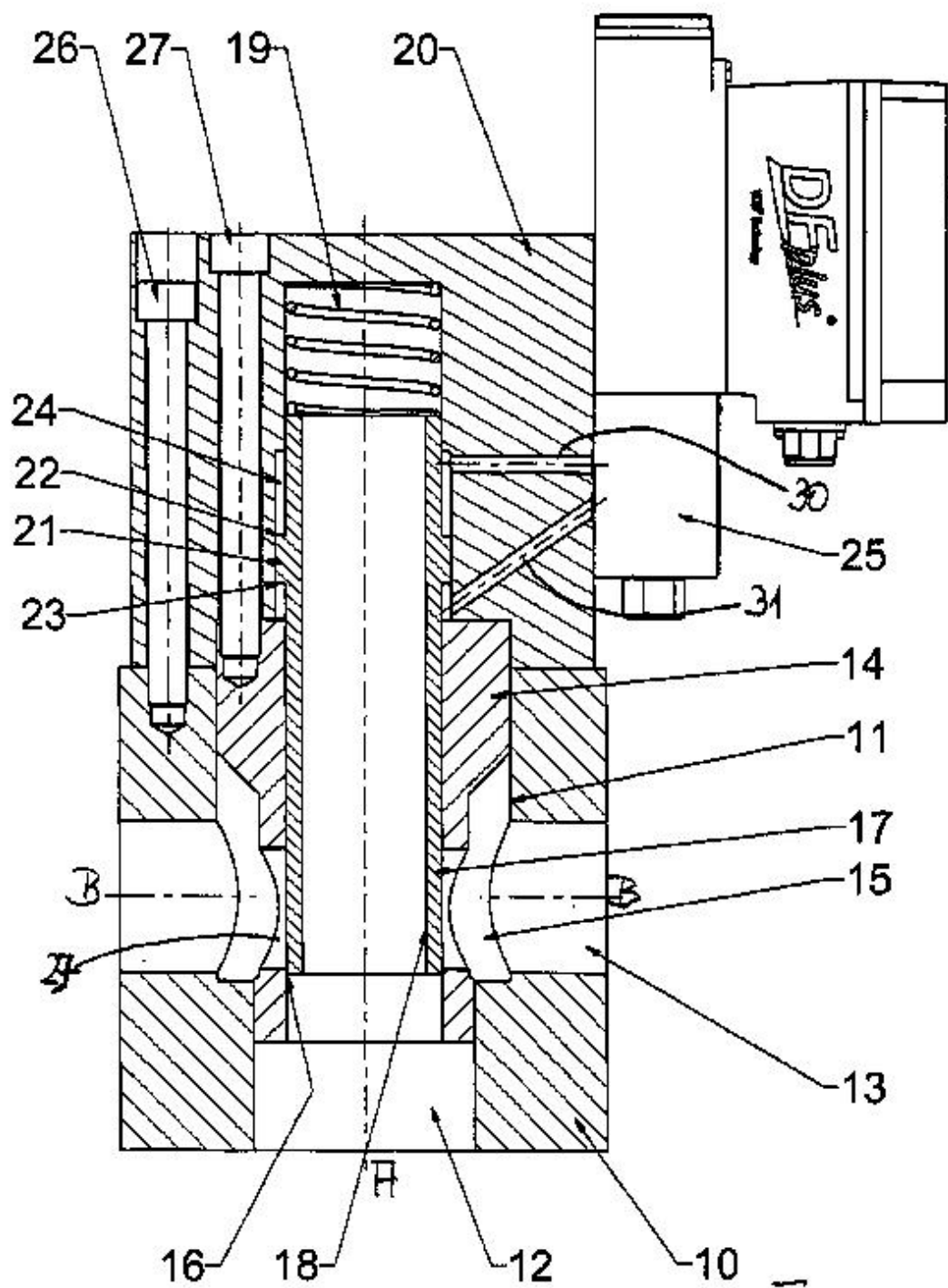
### F16K 3/265

[N: with a sleeve sliding in the direction of the flow line]

#### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



## F16K 3/267

[N: Combination of a sliding valve and a lift valve (F16K3/262, F16K3/265 take precedence)]

### Definition statement

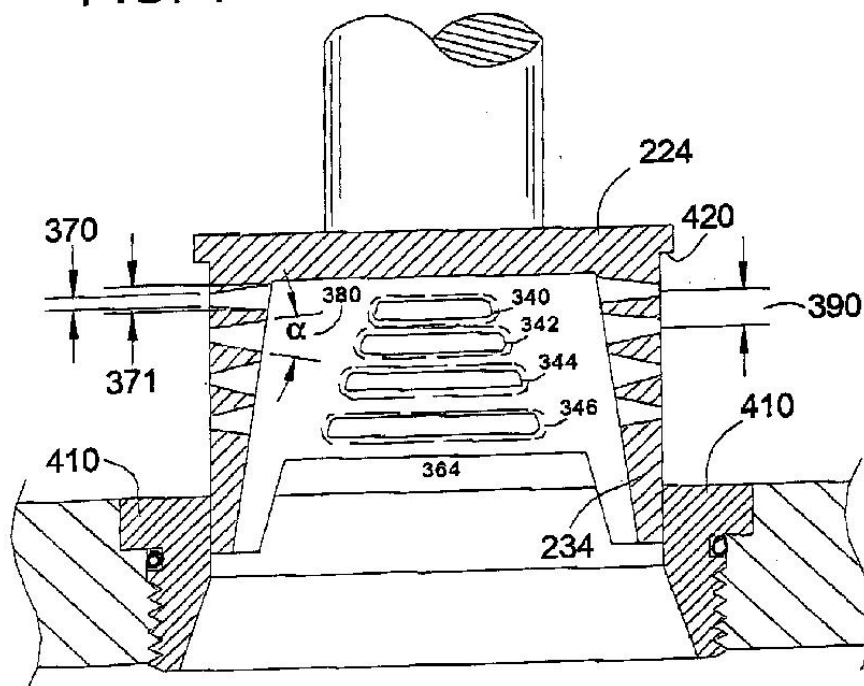
*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

Patent Application Publication Jun. 24, 2004 Sheet 4 of 6

US 2004/0118462 A1

FIG. 4



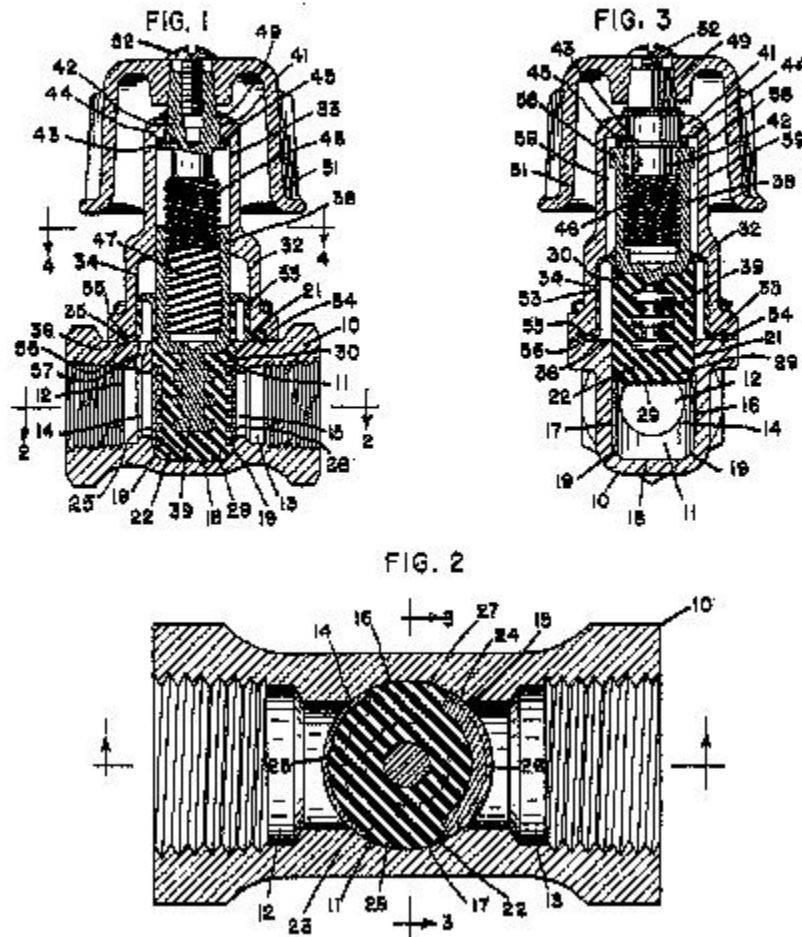
## F16K 3/28

with resilient valve members

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



## F16K 3/30

### Details

#### Definition statement

*This subclass/group covers:*

Constructional details of the valve member, guiding and attachment to the spindle, lubrication and other details of special arrangements for influencing the flow.

## F16K 5/00

[N: Plug valves;] Taps or cocks comprising only cut-off

**apparatus having at least one of the sealing faces shaped as a more or less complete surface of a solid of revolution, the opening and closing movement being predominantly rotary (taps of the lift-valve type F16K1/00)**

### **References relevant to classification in this group**

*This subclass/group does not cover:*

Multiple way taps or cocks	<a href="#">F16K 11/00</a>
----------------------------	----------------------------

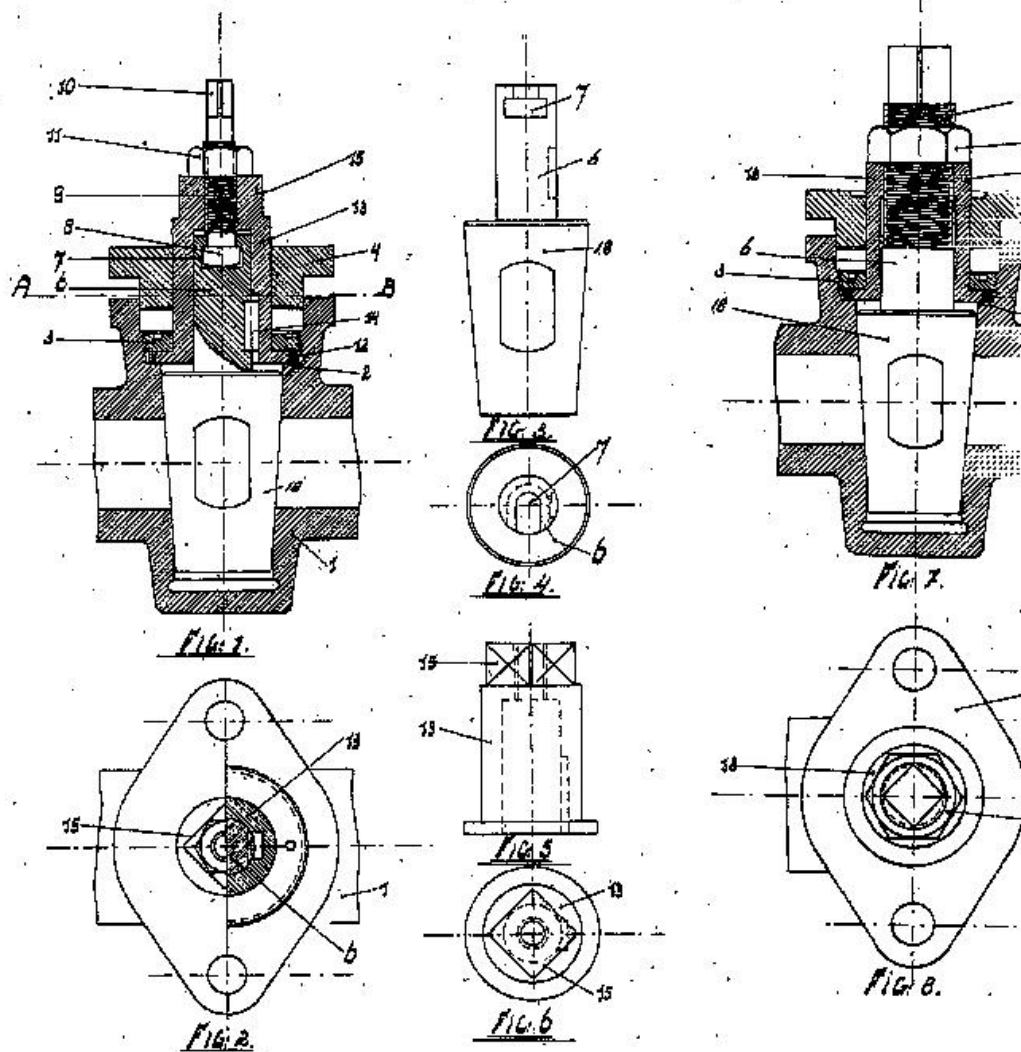
## **F16K 5/02**

**with plugs having conical surfaces; Packings therefor**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



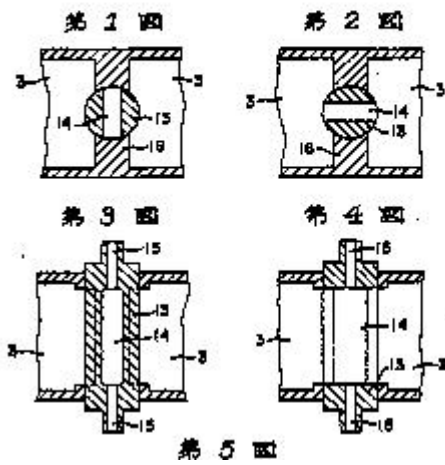
## F16K 5/04

with plugs having cylindrical surfaces; Packings therefor

### Definition statement

This subclass/group covers:

Illustrative example of subject matter classified in this group.



## F16K 5/06

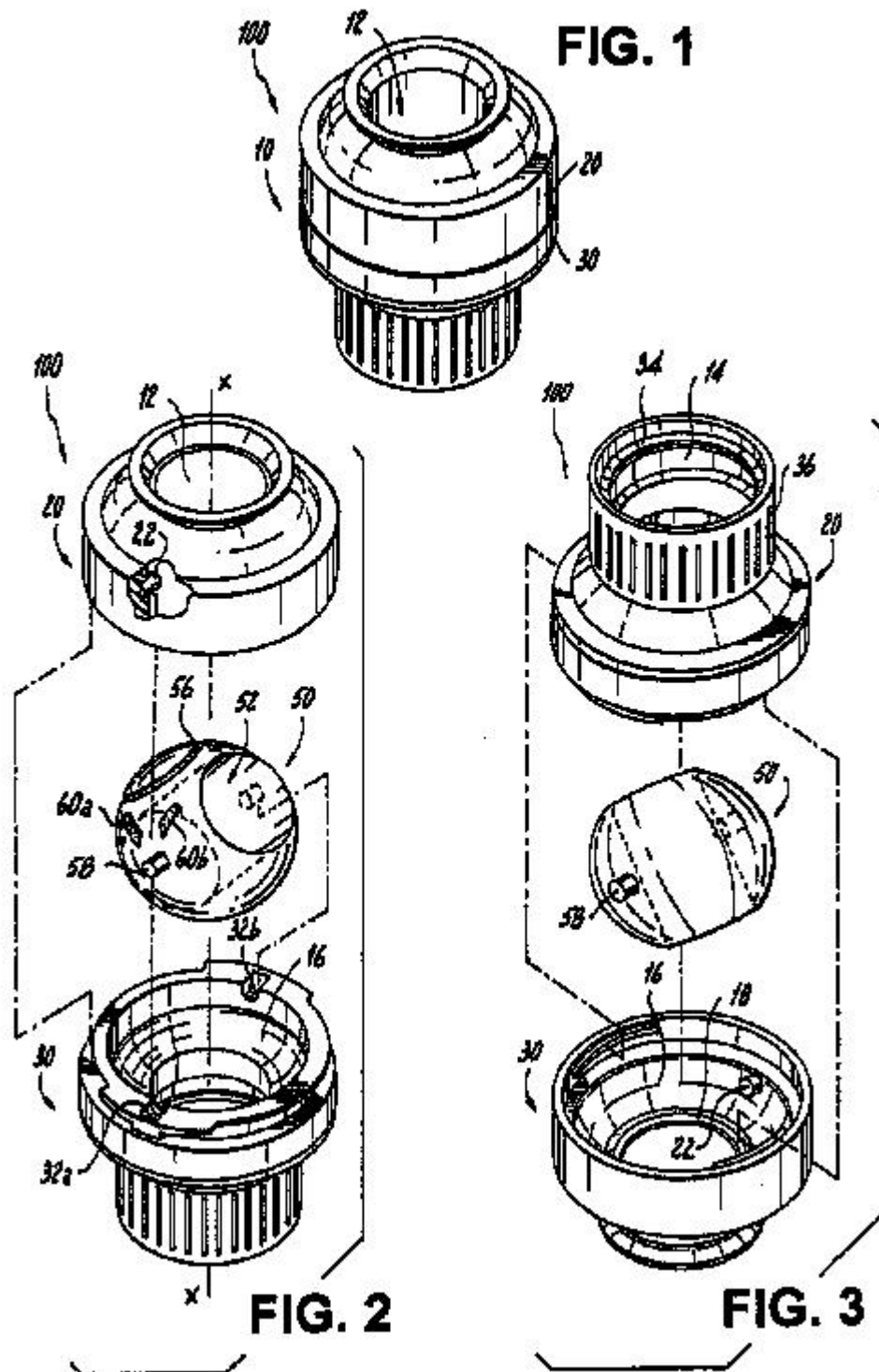
with plugs having spherical surfaces; Packings therefor

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.





**F16K 5/08**

**Details**



## Definition statement

*This subclass/group covers:*

Details of the valve member's sealing not covered by [F16K 5/02](#) to [F16K 5/06](#); Lubrication; Other means for adjusting the flow.

## F16K 7/00

Diaphragm [N: valves or] cut-off apparatus, e.g. with a member deformed, but not moved bodily, to close the passage (container gates or closures operating by deformation of flexible walls B65D90/56; means for plugging pipes or hoses F16L55/10) [N: Pinch valves]

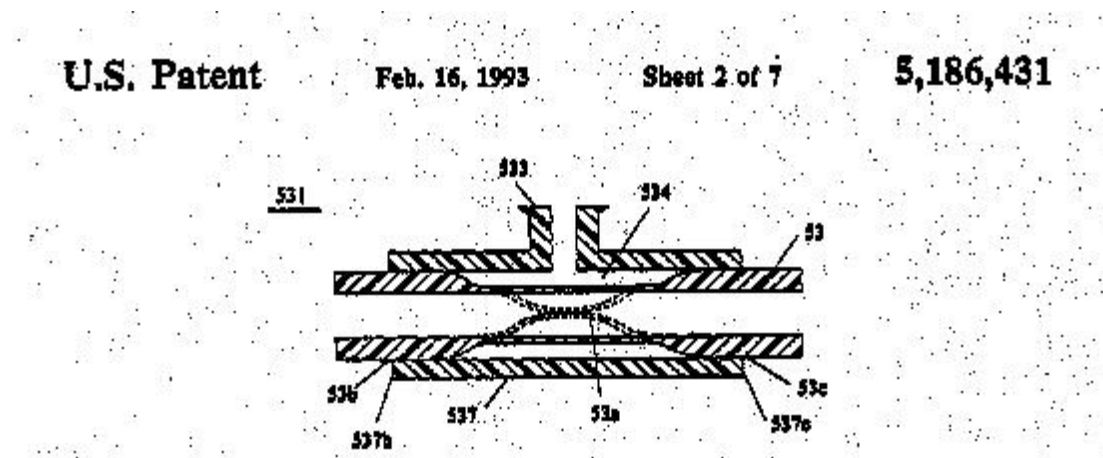
## F16K 7/02

with tubular diaphragm

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



## F16K 7/04

constrictable by external radial force

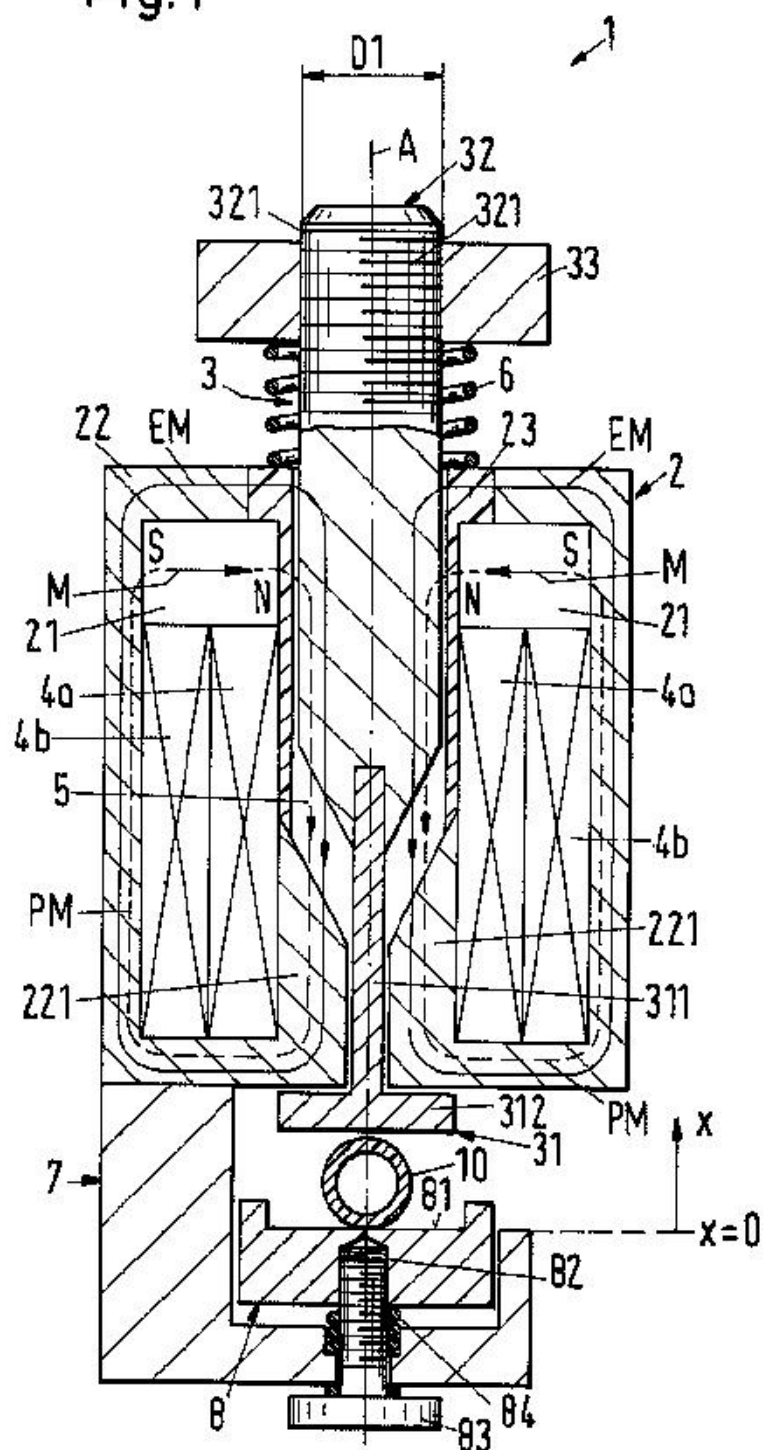
## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



Fig.1



**F16K 7/06**

by means of a screw-spindle, cam, or other mechanical means  
[N: (F16K7/045 takes precedence)]

### Definition statement

*This subclass/group covers:*

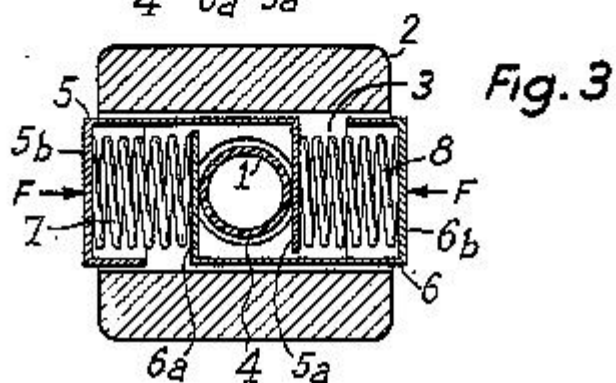
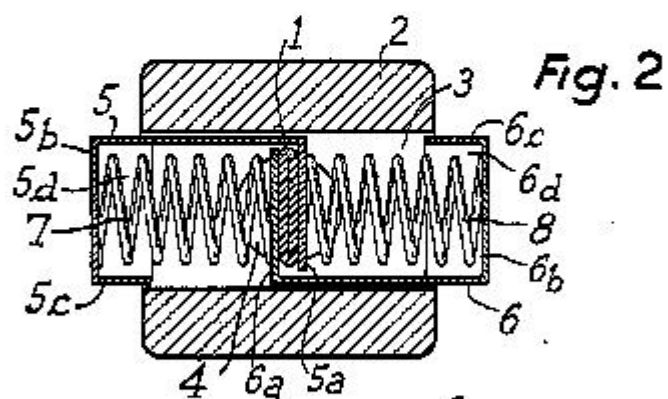
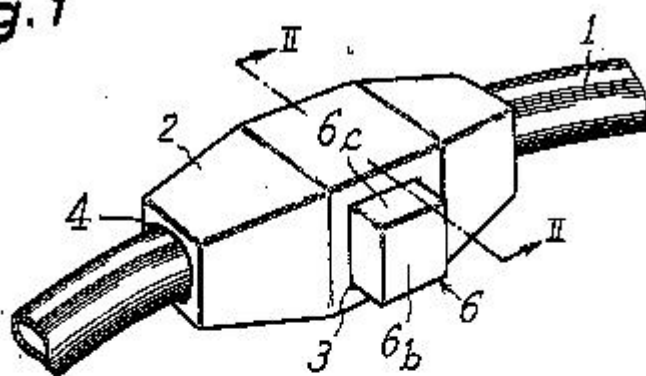
Illustrative example of subject matter classified in this group.

**Nº 1.829.535**

M. Guyot

**Pl. unique**

**Fig. 1**



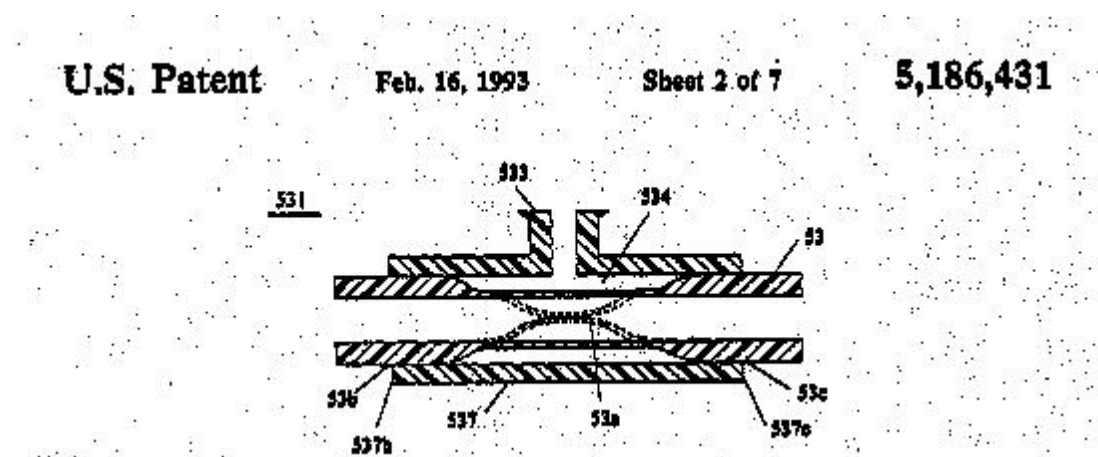
**F16K 7/07**

**by means of fluid pressure**

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



## F16K 7/10

with inflatable member

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

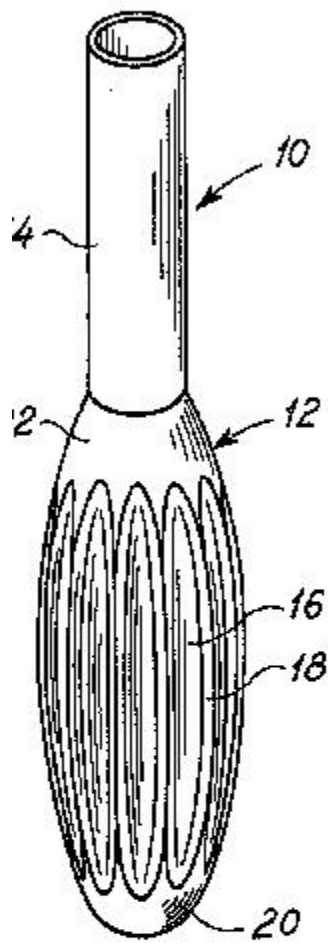


Fig. 1

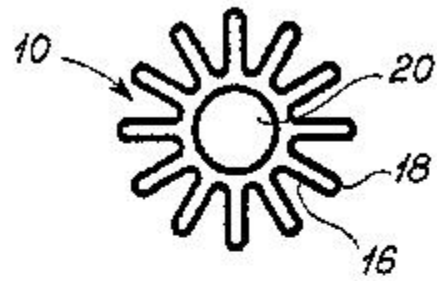


Fig. 2

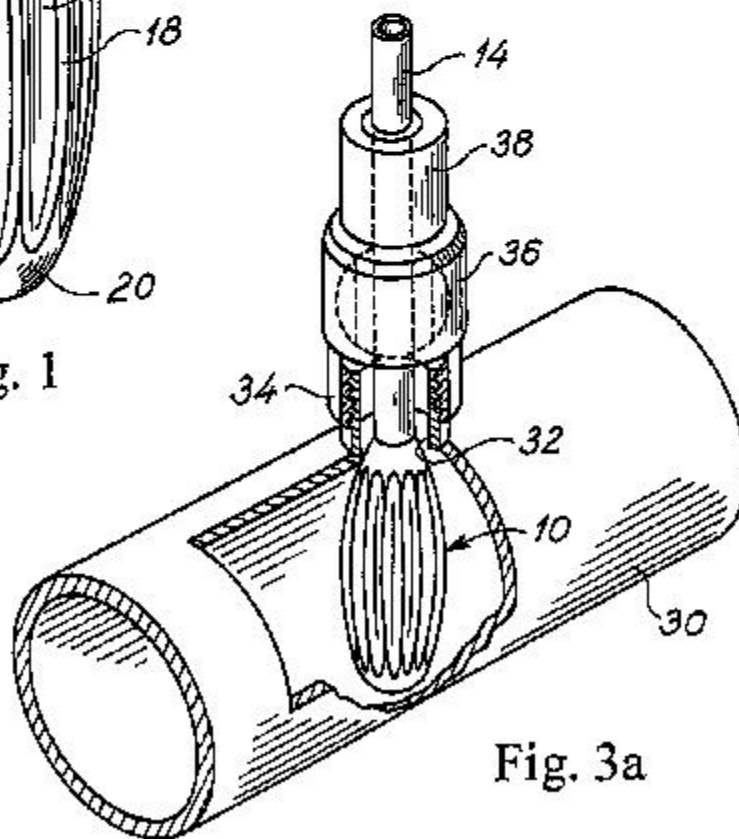


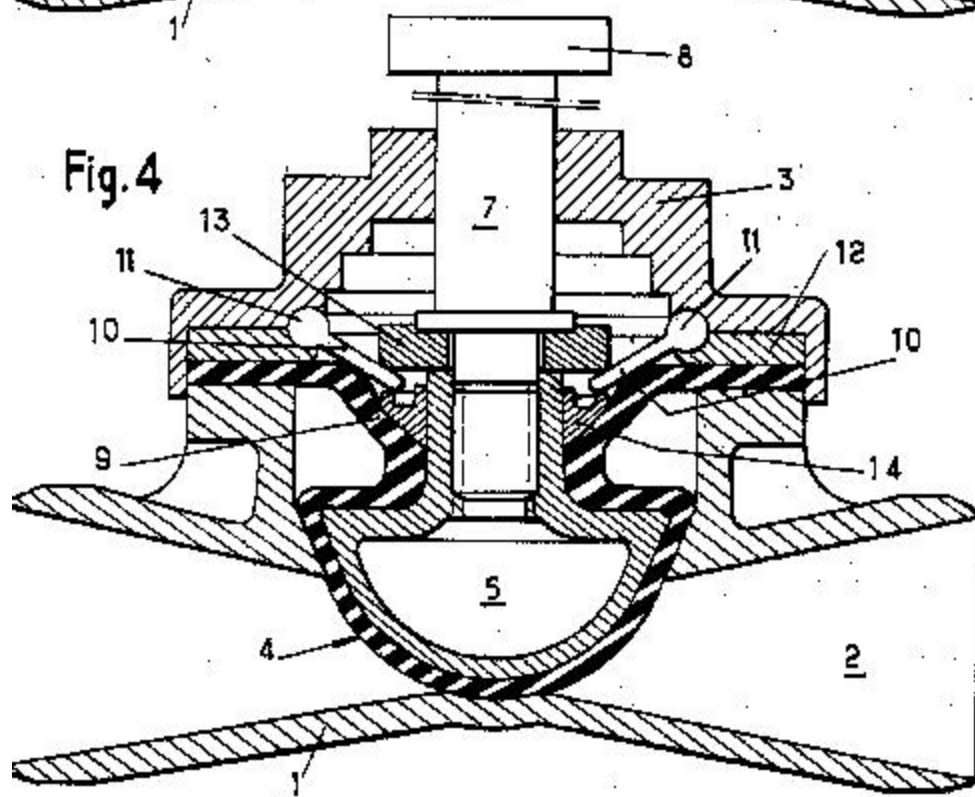
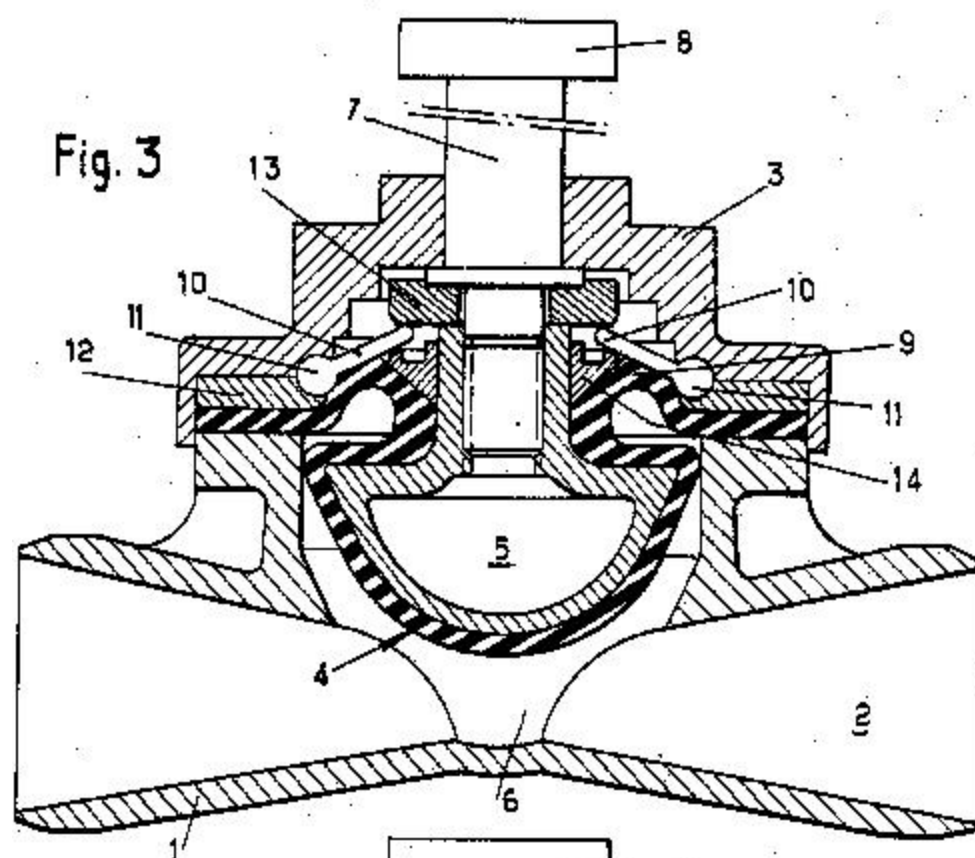
Fig. 3a

**[N: the seat being formed on the bottom of the fluid line]**

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.





## F16K 7/126

[N: the seat being formed on a rib perpendicular to the fluid line]

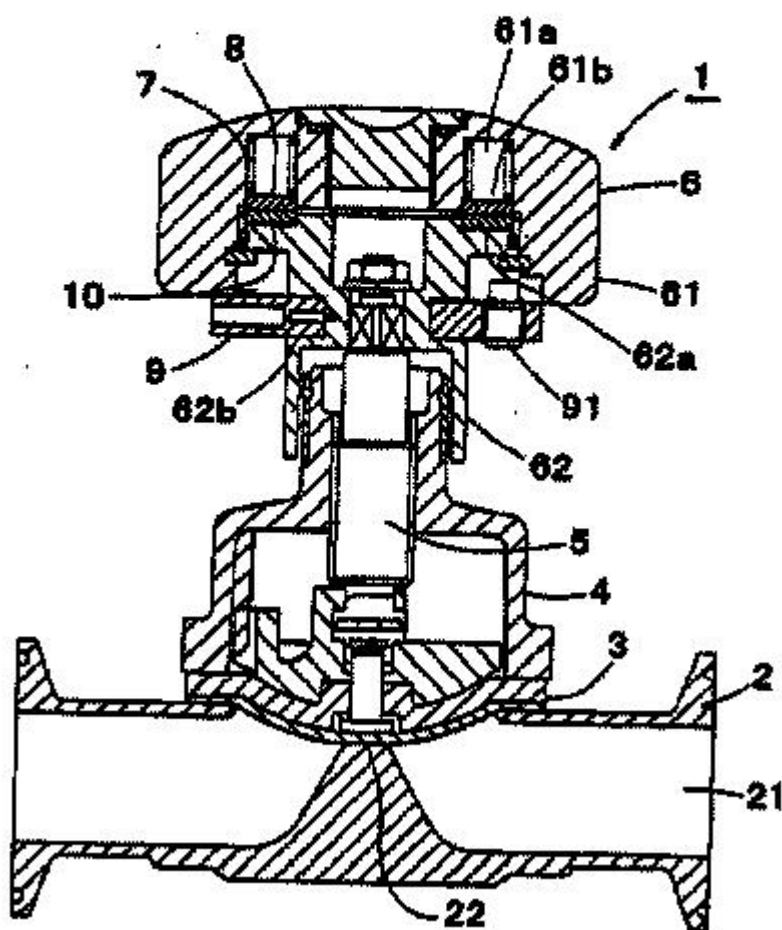
### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

EP 1 729 047 A1

FIG. 1



## F16K 7/14

arranged to be deformed against a flat seat

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

Patent Application Publication Sep. 29, 2011 Sheet 2 of 5 US 2011/0233443 A1

FIG.3A

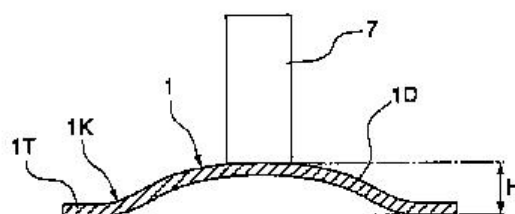


FIG.3B

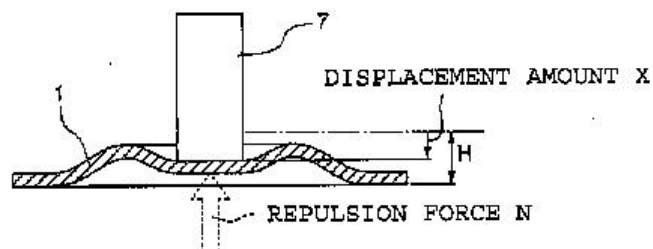
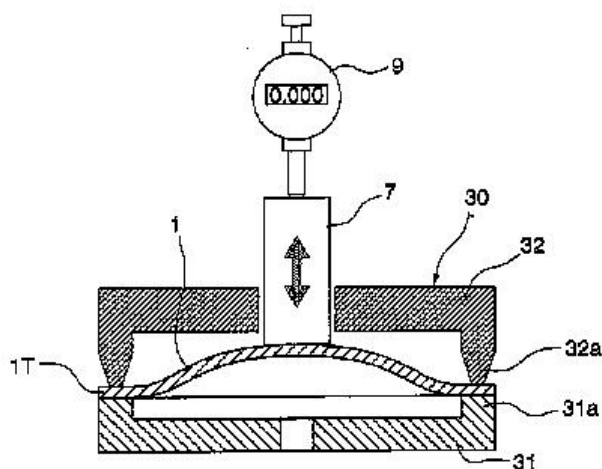


FIG.3C



## F16K 7/18

with diaphragm secured at one side only, e.g. to be laid on the seat by rolling action

### Definition statement

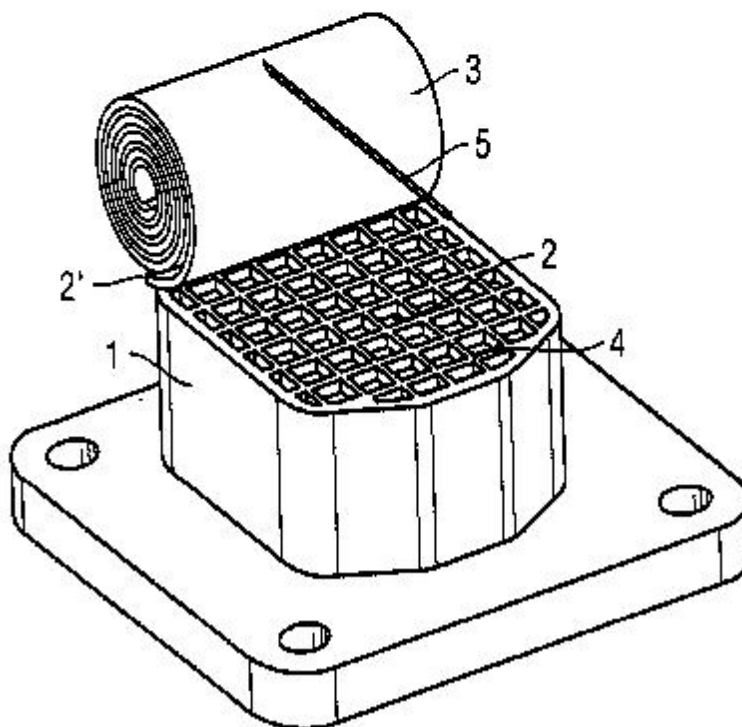
*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

DE 10 2007 010 536 A1 2008.09.11

Anhängende Zeichnungen

FIG 1

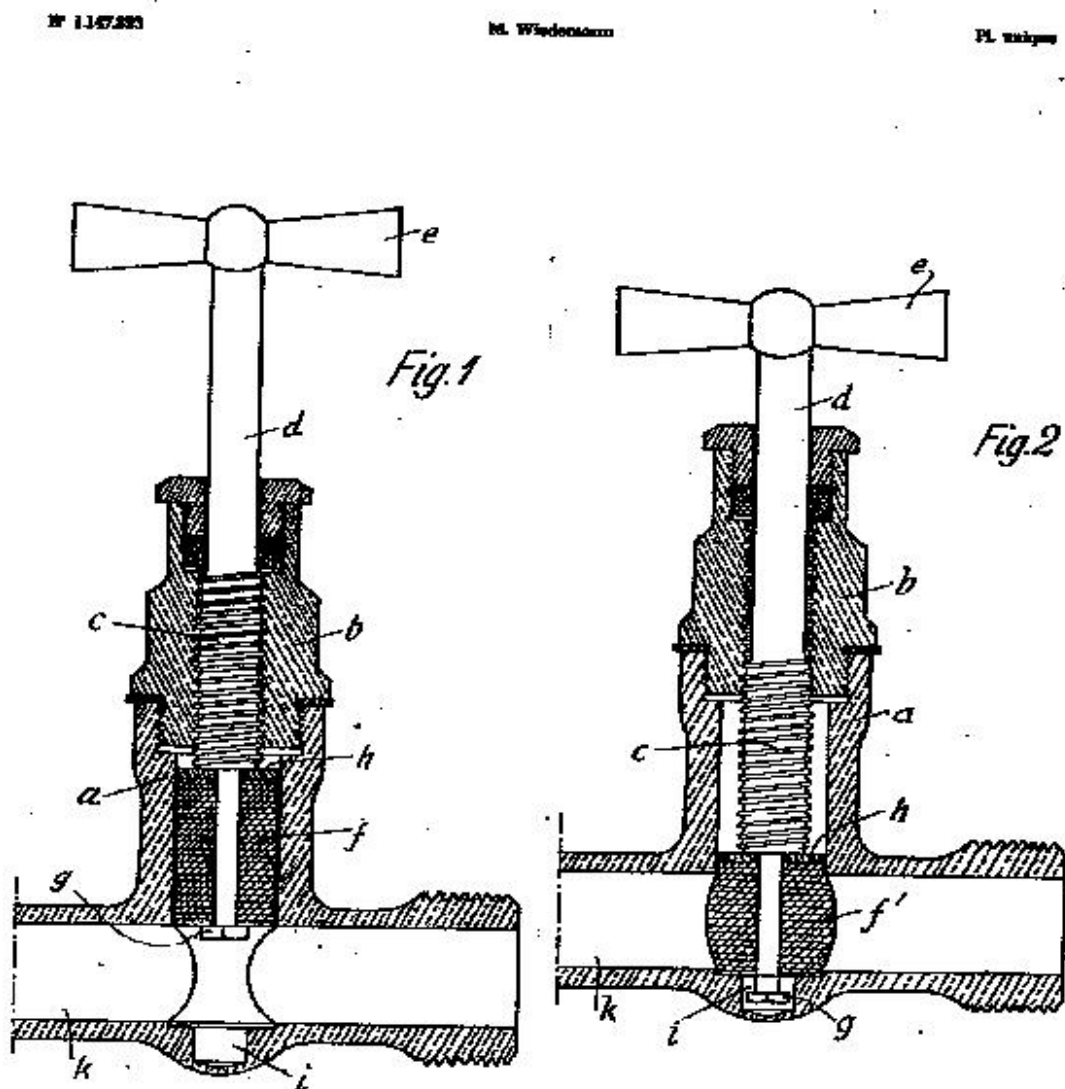


with a compressible solid closure member

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



### F16K 11/00

Multiple-way valves, e.g. mixing valves; Pipe fittings incorporating such valves

### References relevant to classification in this group

*This subclass/group does not cover:*

Faucet diverter valves	<a href="#">E03C</a>
------------------------	----------------------

---

## **F16K 11/02**

**with all movable sealing faces moving as one unit**

### **Definition statement**

*This subclass/group covers:*

A common valve member seals several seats

## **F16K 11/044**

**with movable valve members positioned between valve seats**

### **Definition statement**

*This subclass/group covers:*

Stationary valve seats and a movable valve member.

Illustrative example:



*This subclass/group covers:*

Stationary seats positioned between movable valve members.

Illustrative example:

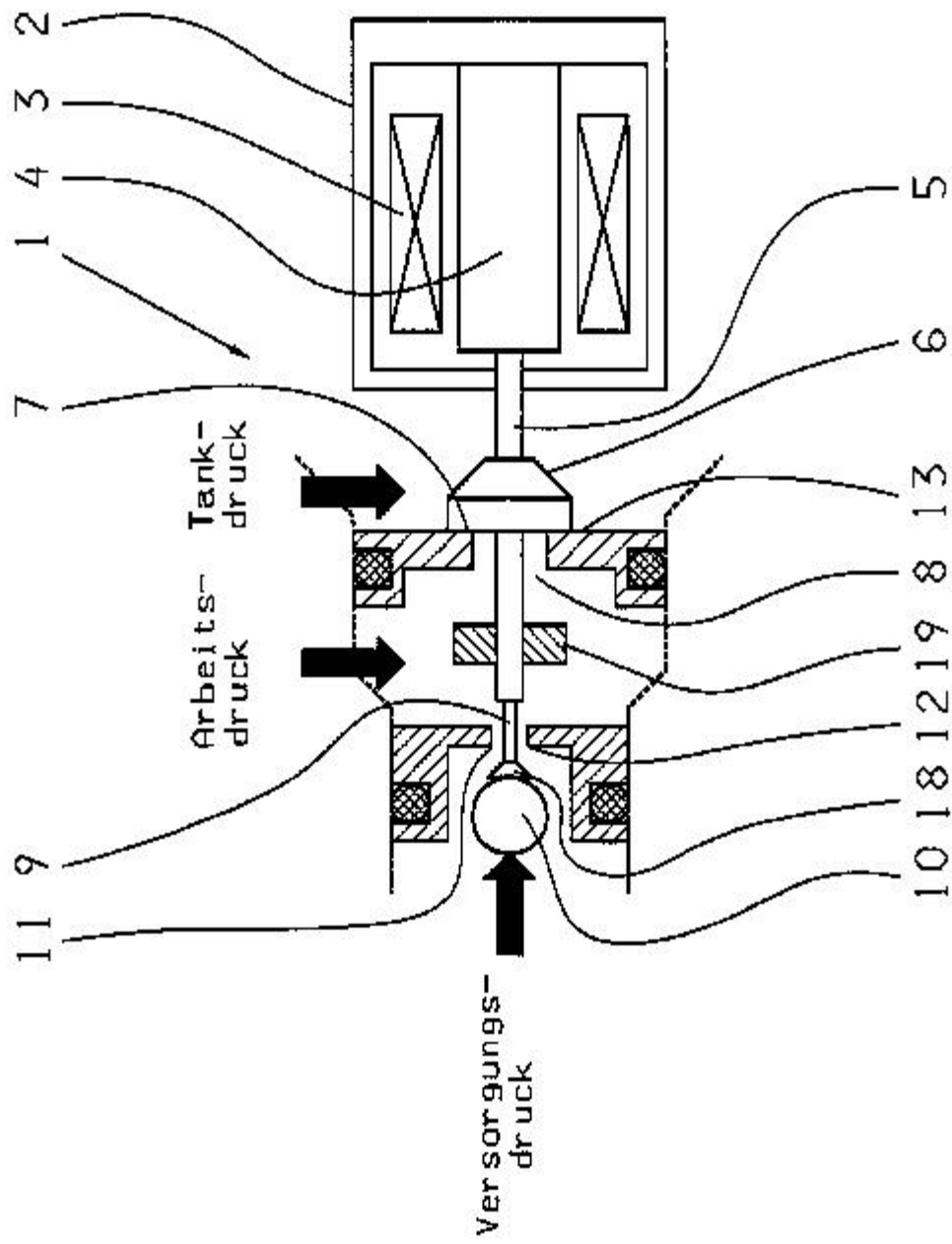


Fig. 3



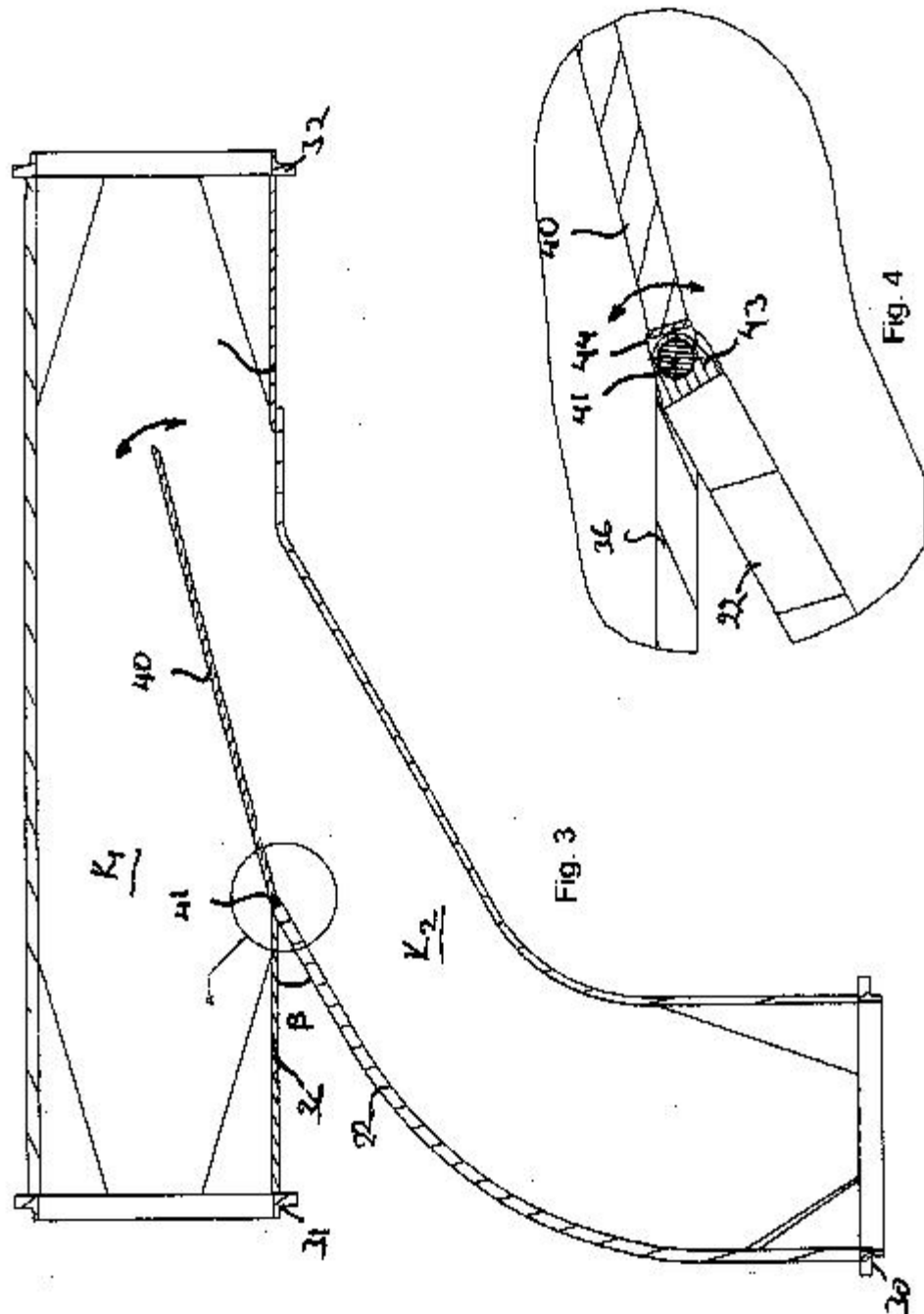
## **F16K 11/052**

**with pivoted closure members, e.g. butterfly valves**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



**F16K 11/056**

with ball-shaped valve members

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

EP 1 593 788 A1

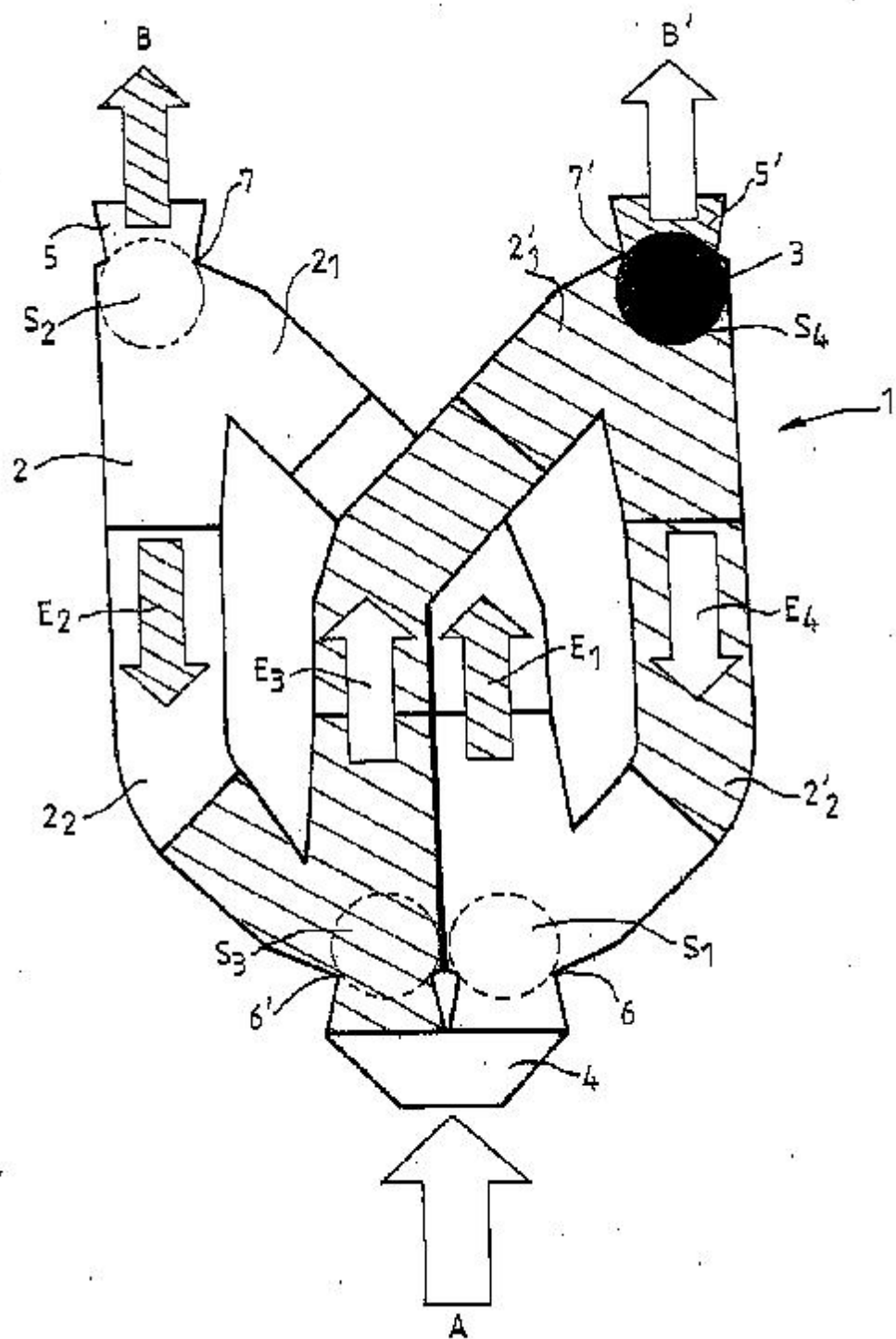


FIGURE UNIQUE

## F16K 11/0565

[N: moving in a combined straight line and rotating movement]

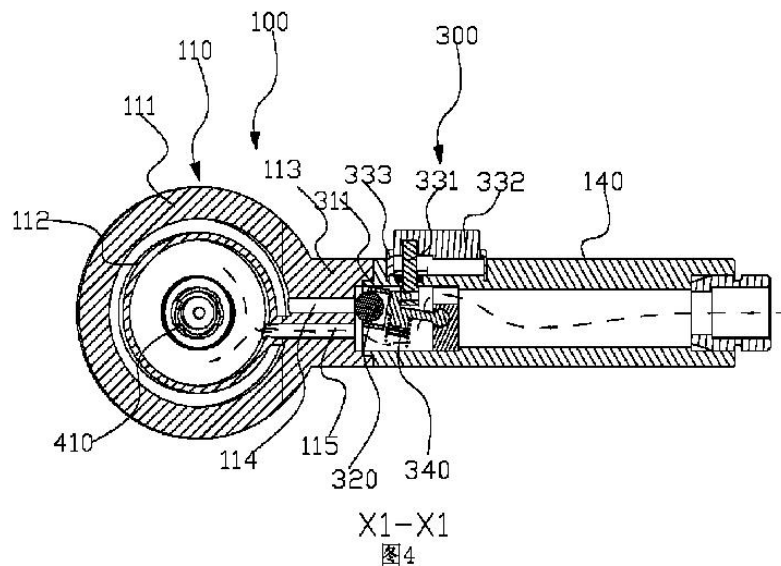
### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

WO 2011/103795

PCT/CN2011/071127



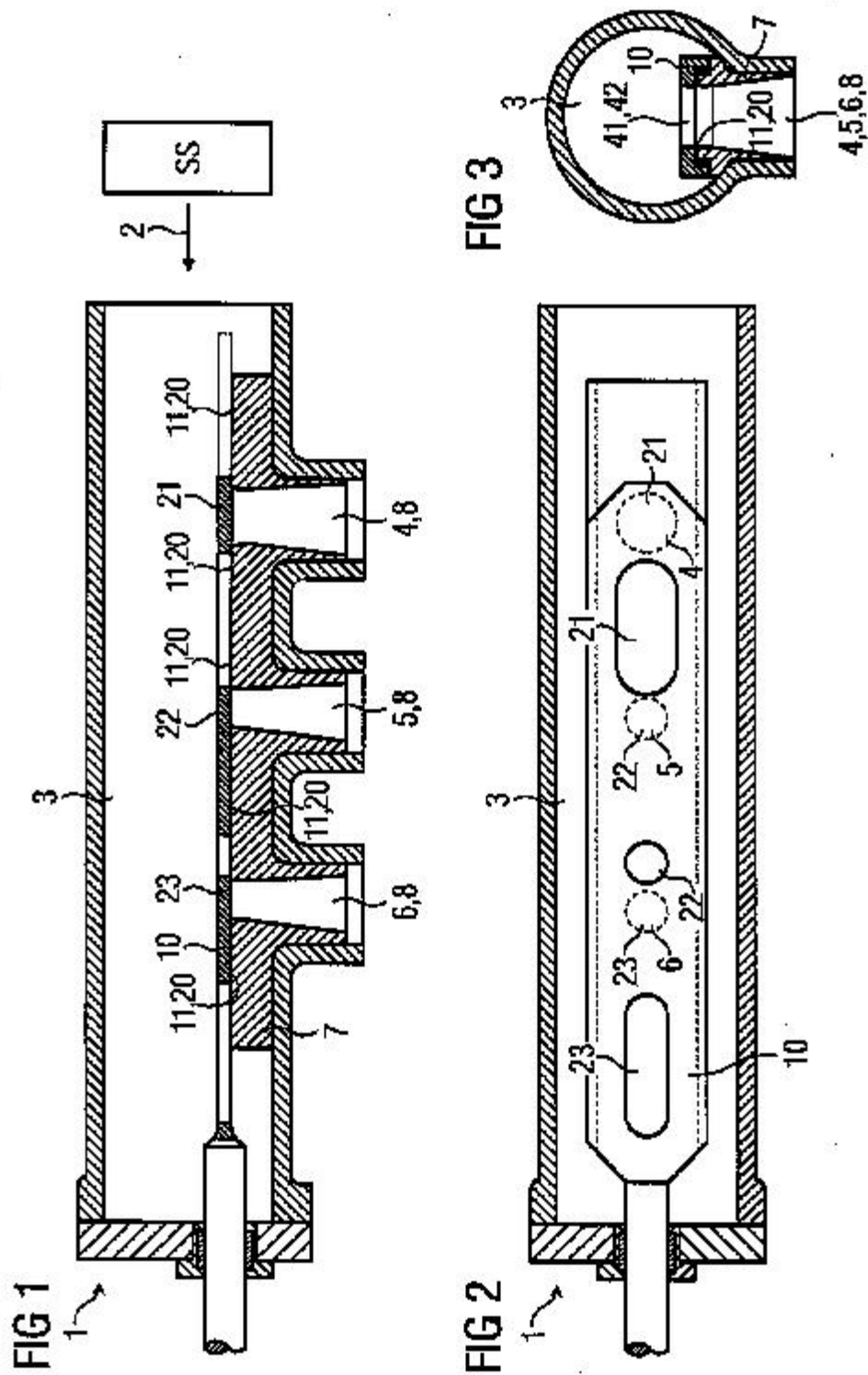
## F16K 11/0655

[N: with flat slides]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



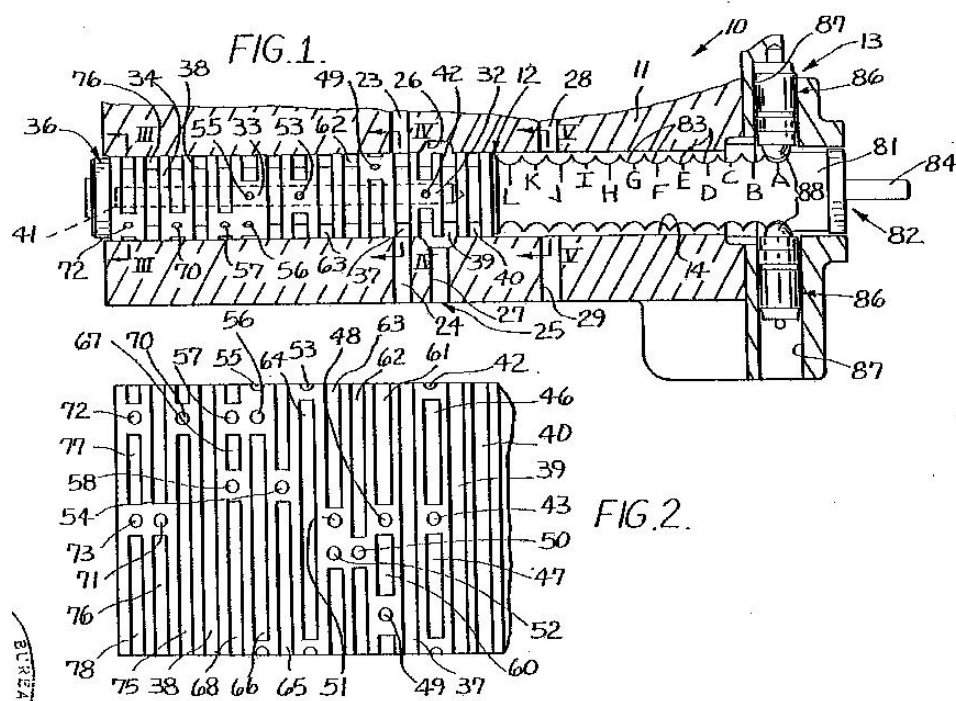
**F16K 11/0704**

[N: comprising locking elements]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



W/O 82/01403

PCT/US80/01398

## F16K 11/0708

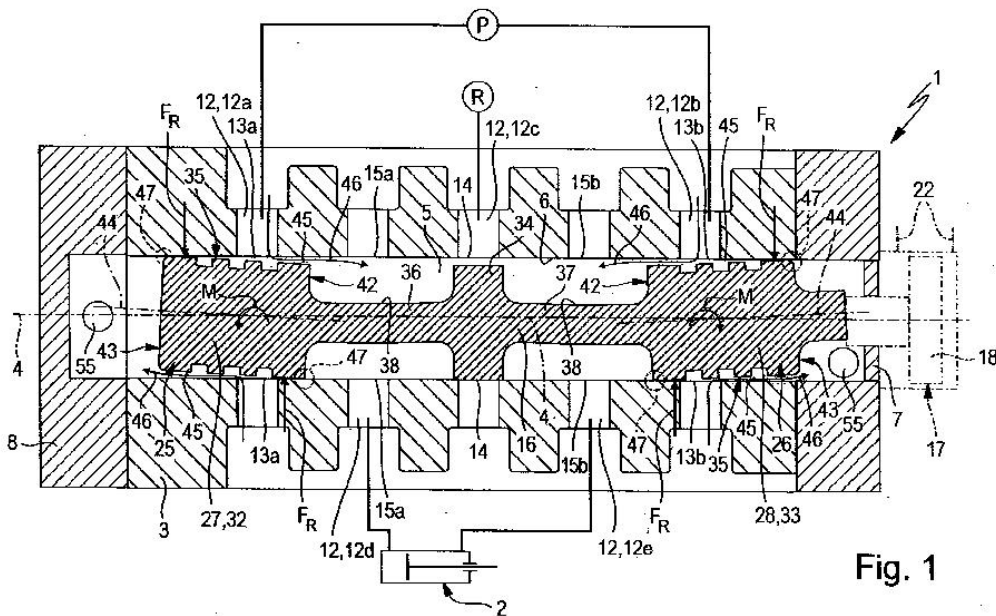
[N: comprising means to avoid jamming of the slide or means to modify the flow]

## Definition statement

*This subclass/group covers:*

Including means for modifying the flow for avoiding the jamming of the slide.

Illustrative example:



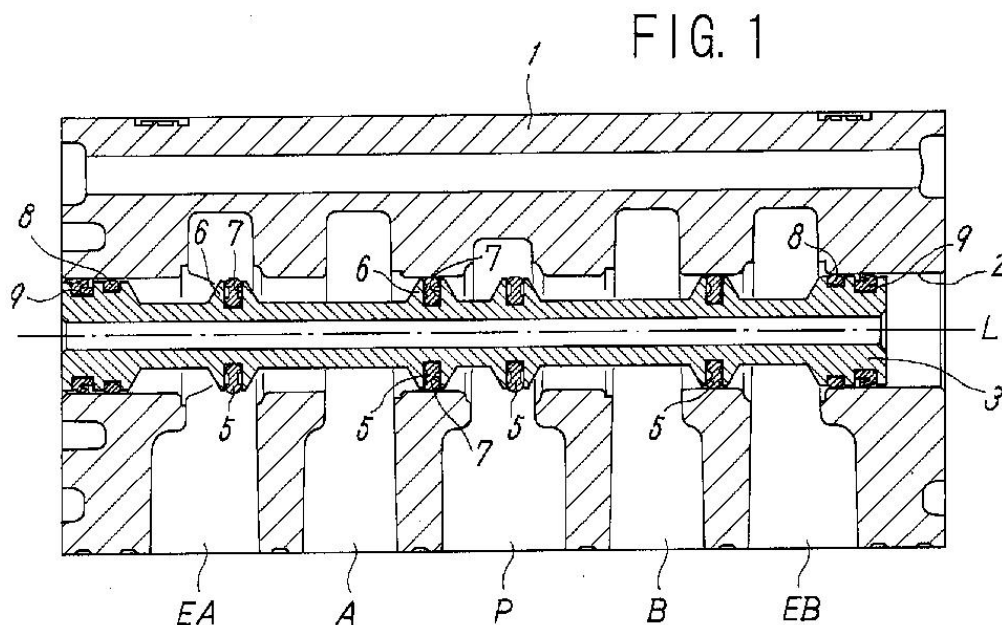
**F16K 11/0712**

[N: comprising particular spool-valve sealing means]

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



**[N: with fluid passages through the valve member  
(F16K11/0704, F16K11/0708, F16K11/0712 take precedence)]**

## Definition statement

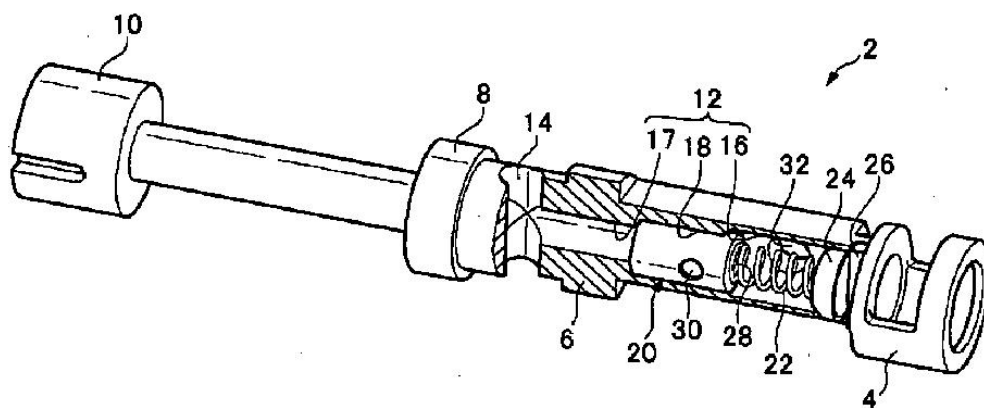
*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

Patent Application Publication Jun. 7, 2007 Sheet 2 of 4

US 2007/0125433 A1

FIG.2



**F16K 11/072**

## with pivoted closure members

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



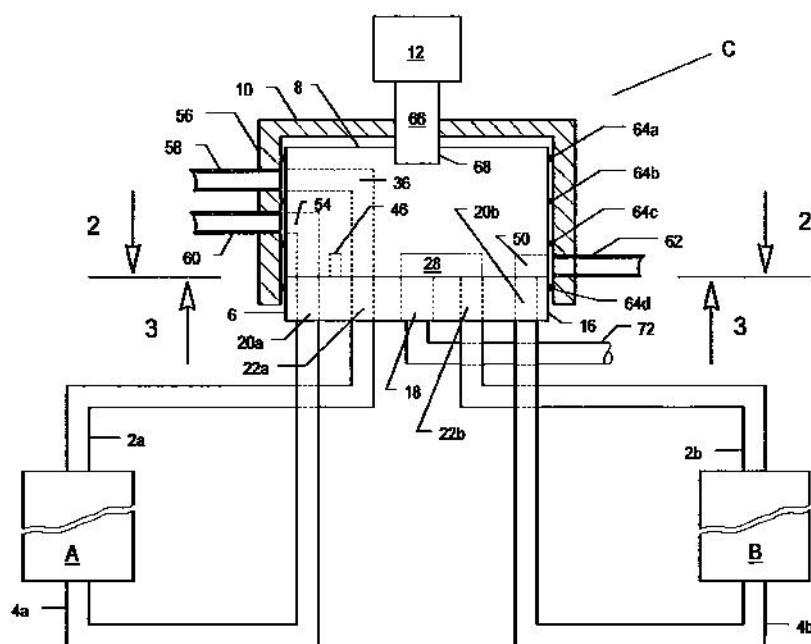


FIG. 1

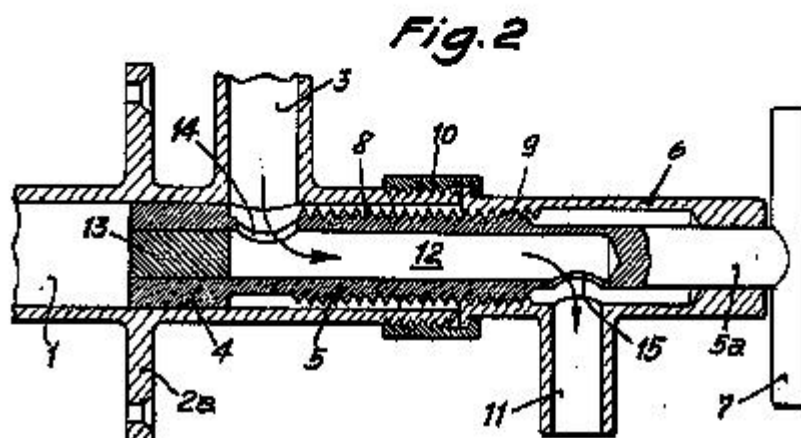
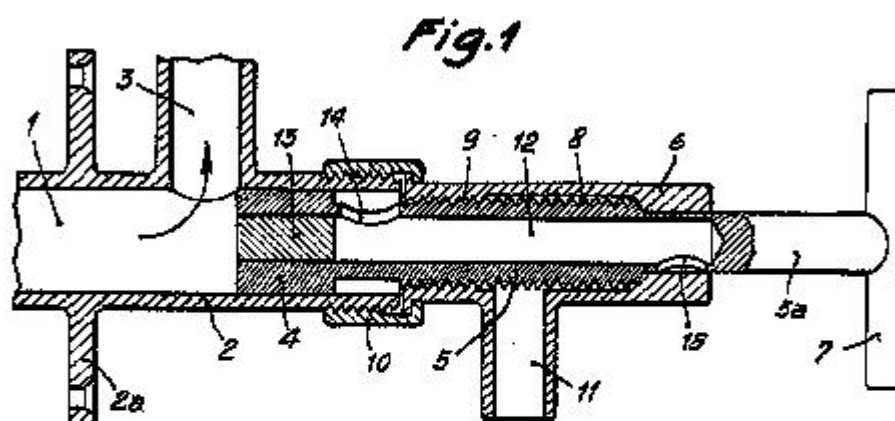
## F16K 11/078

with pivoted and linearly movable closure members

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



## F16K 11/10

with two or more closure members not moving as an unit

### Definition statement

*This subclass/group covers:*

Multiple-way valves with either a common actuating means or separate actuating means for every valve member.

## F16K 13/00

Other constructional types of cut-off apparatus (means for

plugging pipes or hoses F16L55/10); Arrangements for cutting-off

### Definition statement

*This subclass/group covers:*

Valve arrangements which do not belong per se to any of the previous constructional classes or having a function which cannot be classified under the existing functional classes.

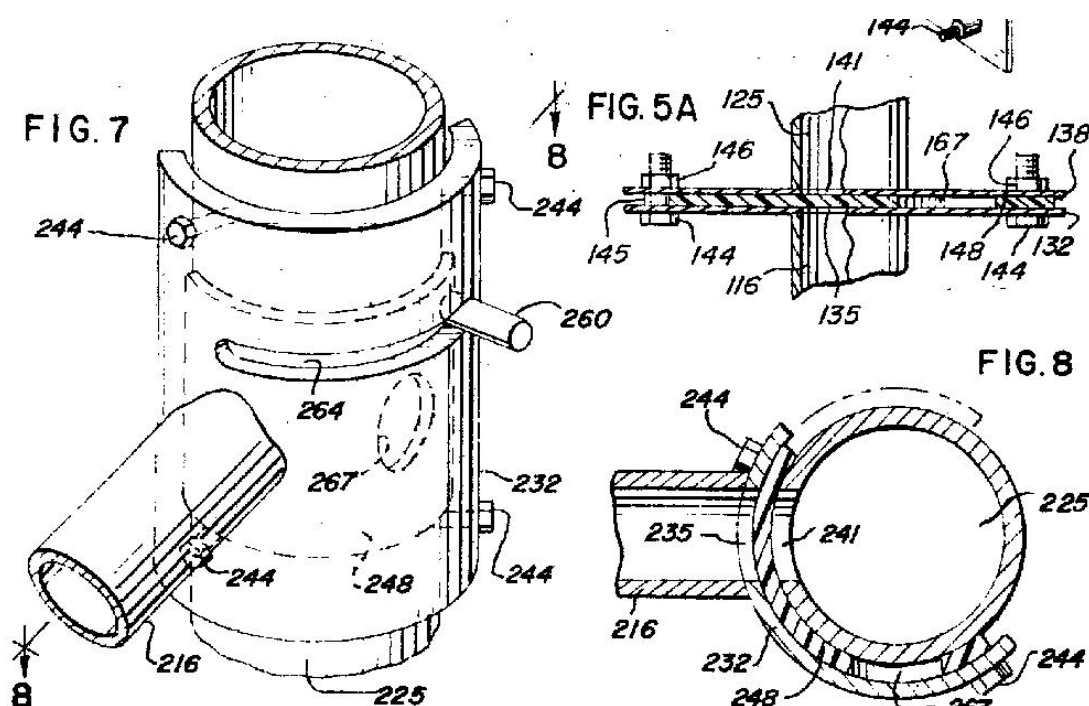
## F16K 13/02

with both sealing faces shaped as small segments of a cylinder and the moving member pivotally mounted

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



## F16K 13/04

[N: IPC3] with a breakable closure member

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

FIG. 1.

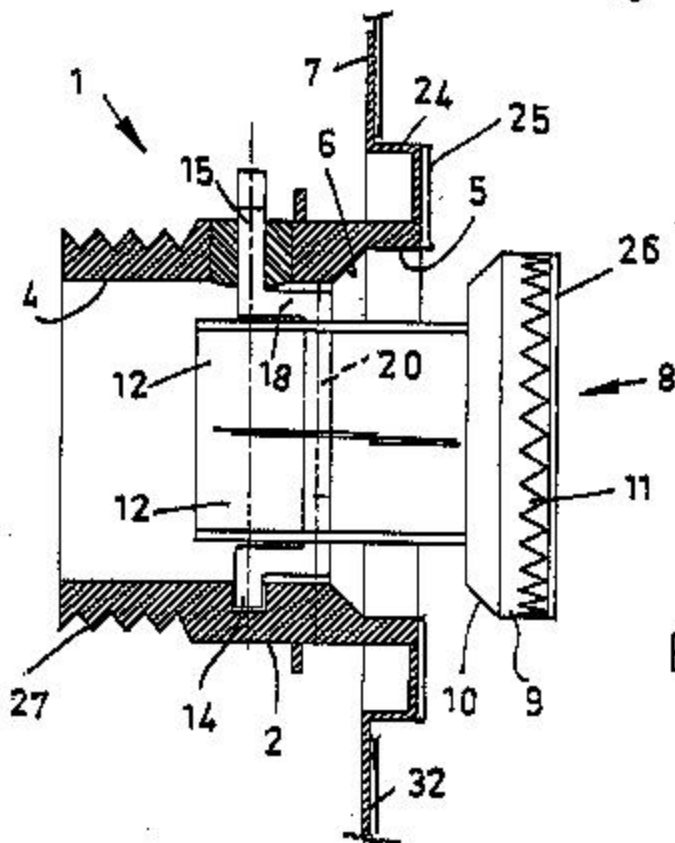
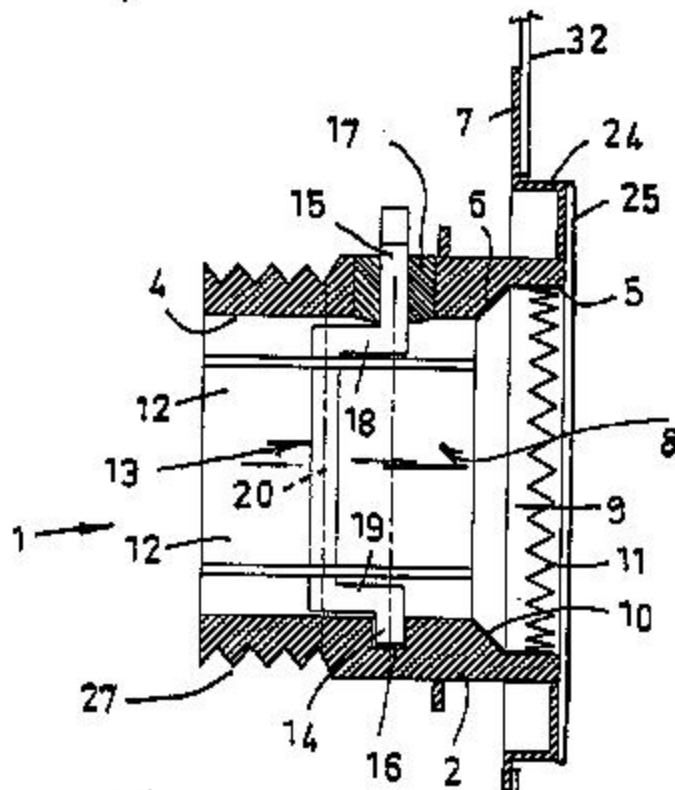


FIG. 2.

by means of liquid or granular medium

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

WO 2004/000475

PCT/GB2003/002697

4/4

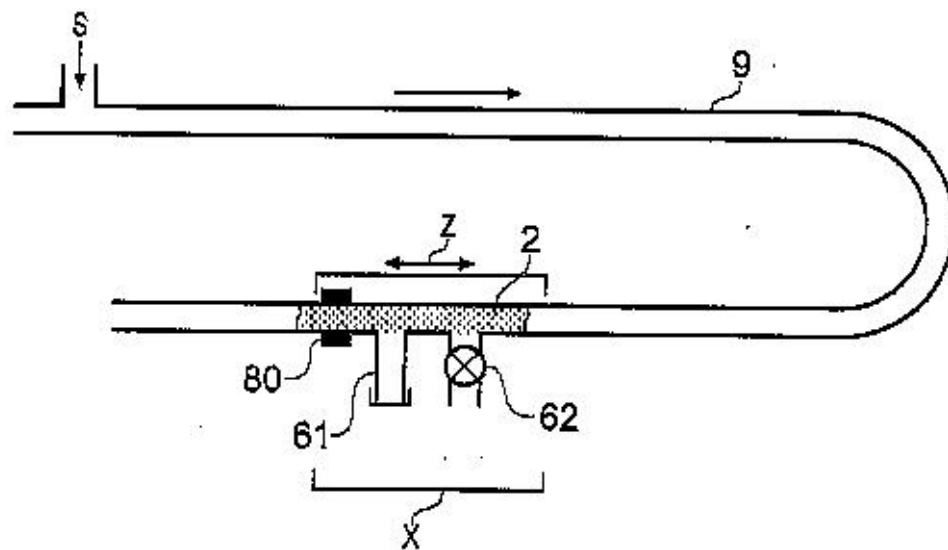


Fig. 10

### F16K 15/00

Check valves (valves specially adapted for inflatable balls  
A63B41/00)

### Special rules of classification within this group

Valves classified in [F16K 17/00](#) can also be classified in this class when structural features so entitle.

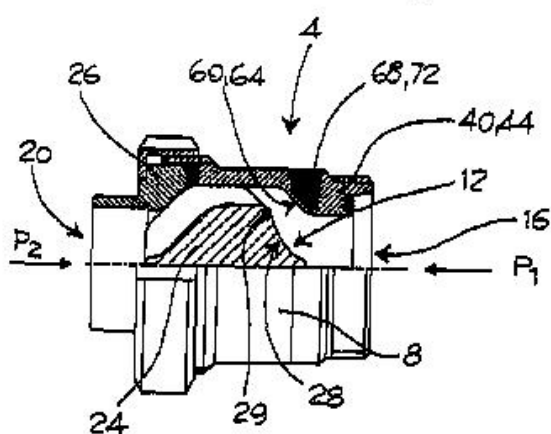
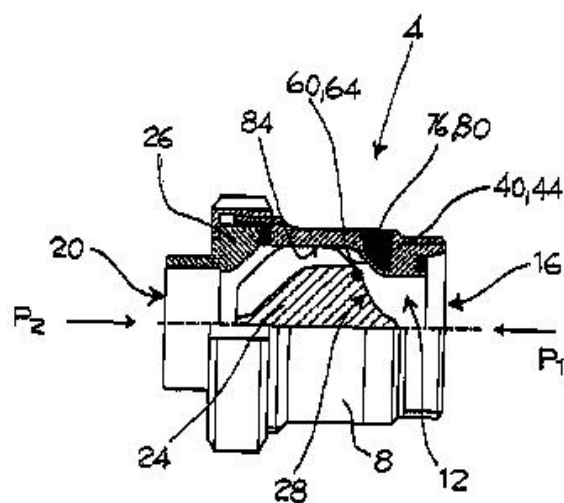
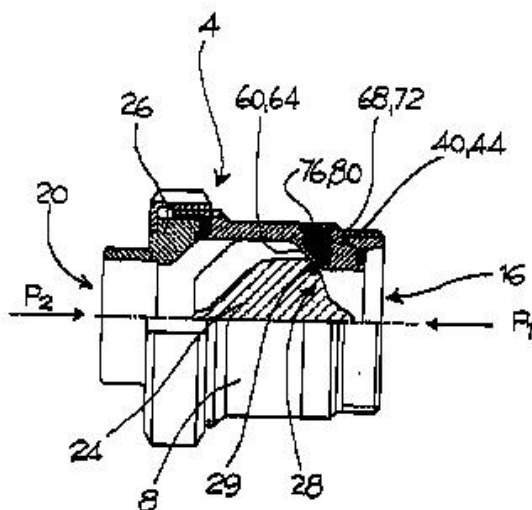
## **F16K 15/02**

**with guided rigid valve members**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

*Fig. 2**Fig. 3**Fig. 4***F16K 17/00**

Safety valves; Equalising valves, [N: e.g. pressure relief valves]

### **Special rules of classification within this group**

Check valves ([F16K 15/00](#)) can be classified in this sub-class when their function can be identified as falling under this title.

### **F16K 17/003**

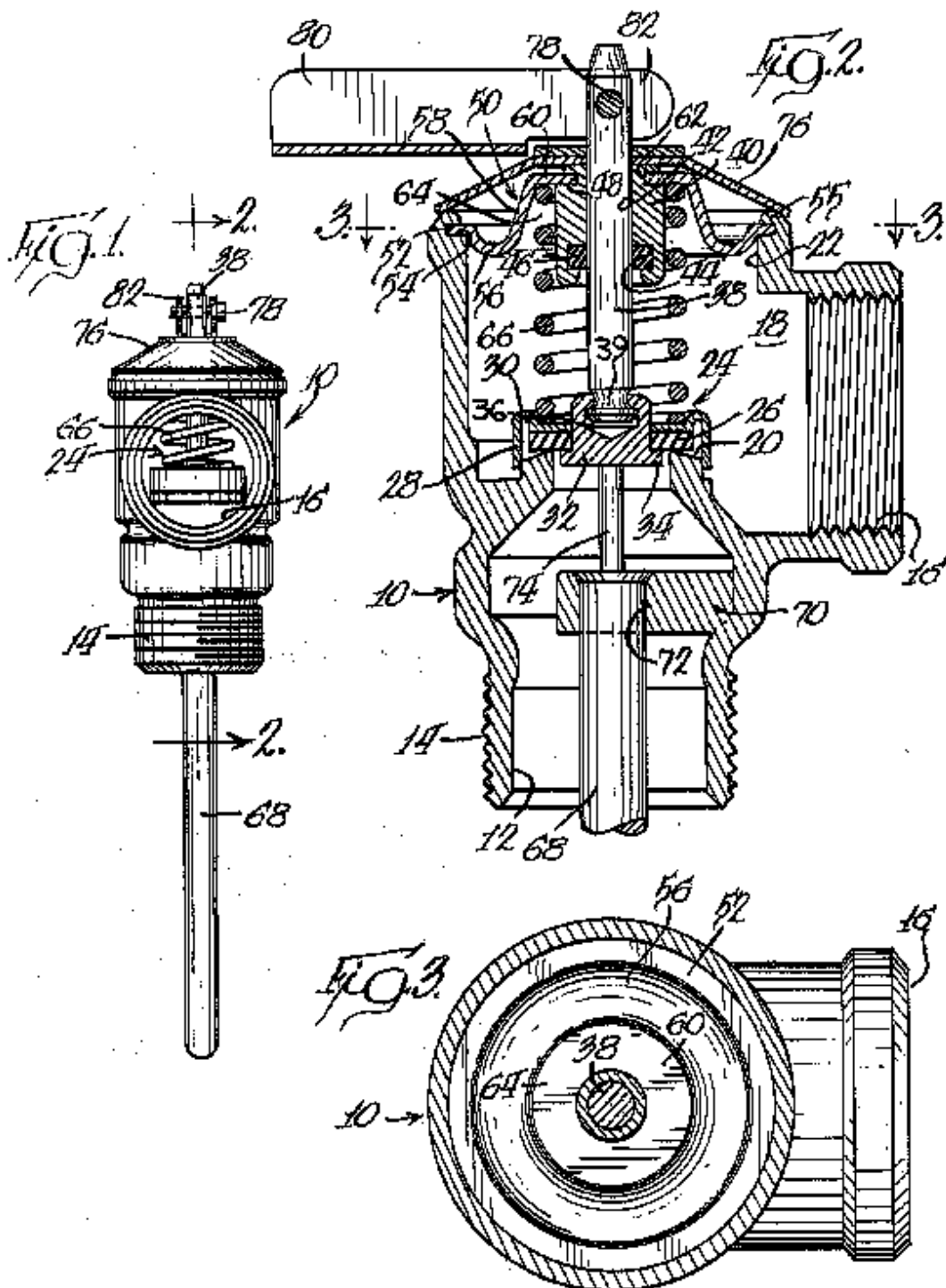
**[N: reacting to pressure and temperature]**

#### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.





### References relevant to classification in this group

This subclass/group does not cover:

Actuated by temperature only

[F16K 31/002](#)

---

## **F16K 17/006**

**[N: specially adapted for shelters]**

### **Definition statement**

*This subclass/group covers:*

Adapted for bomb-shelters.

## **F16K 19/00**

**[N: IPC 3] Arrangements of valves and flow lines specially adapted for mixing fluids (multiple-way valves F16K11/00)**

### **Definition statement**

*This subclass/group covers:*

When no details of the valve members or seats are disclosed in the document.

## **F16K 21/00**

**Fluid-delivery valves, [N: e.g. self-closing valves] (for liquid handling B67D; for flushing devices for water-closets or the like E03D)**

### **Definition statement**

*This subclass/group covers:*

Valves that are either self-closing or provide a continuous small flow.

## **F16K 23/00**

**Valves for preventing drip from nozzles**

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Nozzles, spray heads or other discharge apparatus for spraying or atomising	<a href="#">B05B</a>
---	----------------------

## F16K 24/00

Devices, e.g. valves, for venting or aerating enclosures (equalising valves F16K17/00; arrangement or mounting in pipes or pipe systems F16L55/07; venting or aerating as an additional function of steam traps or like apparatus F16T; ventilation of rooms, vehicles, see the appropriate subclass, e.g. F24F)

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Fuel tanks	<a href="#">B60K</a>
------------	----------------------

## F16K 24/04

for venting only (F16K24/02 takes precedence)

### Definition statement

*This subclass/group covers:*

The air (or fluid) from the circuit is released.

## F16K 24/06

for aerating only (F16K24/02 takes precedence)

### Definition statement

*This subclass/group covers:*

Fluid (air) is admitted in the circuit.

### References relevant to classification in this group

*This subclass/group does not cover:*

Venting of plumbing installations, waste pipes	<a href="#">E03C</a>
--	----------------------

## F16K 25/00

Details relating to contact between valve members and seat (sealing constructions, see the appropriate groups according

**to the type of valve; movement of valve members other than for opening and closing F16K29/00)**

**Definition statement**

*This subclass/group covers:*

Materials and arrangements of valve members and seats not otherwise provided for

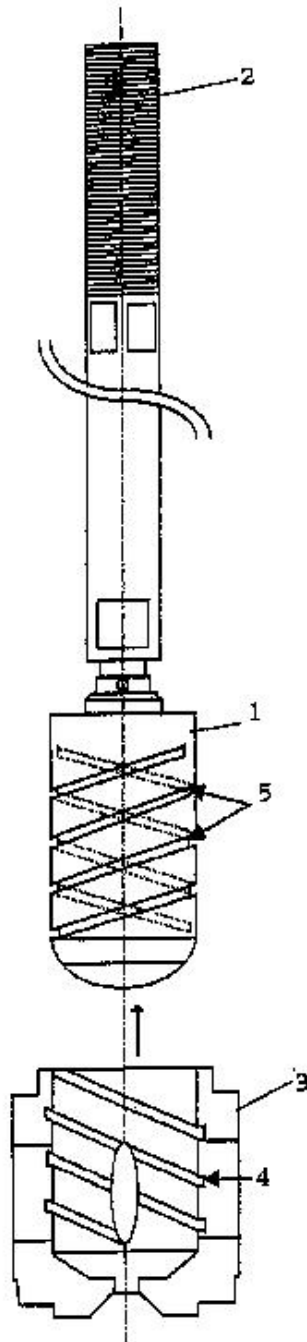
**F16K 25/02**

**Arrangements using fluid issuing from valve members or seats**

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



## **F16K 27/00**

Construction of housing (methods for welding housings B23K); Use of materials therefor

## **F16K 27/003**

[N: Housing formed from a plurality of the same valve elements]

## Definition statement

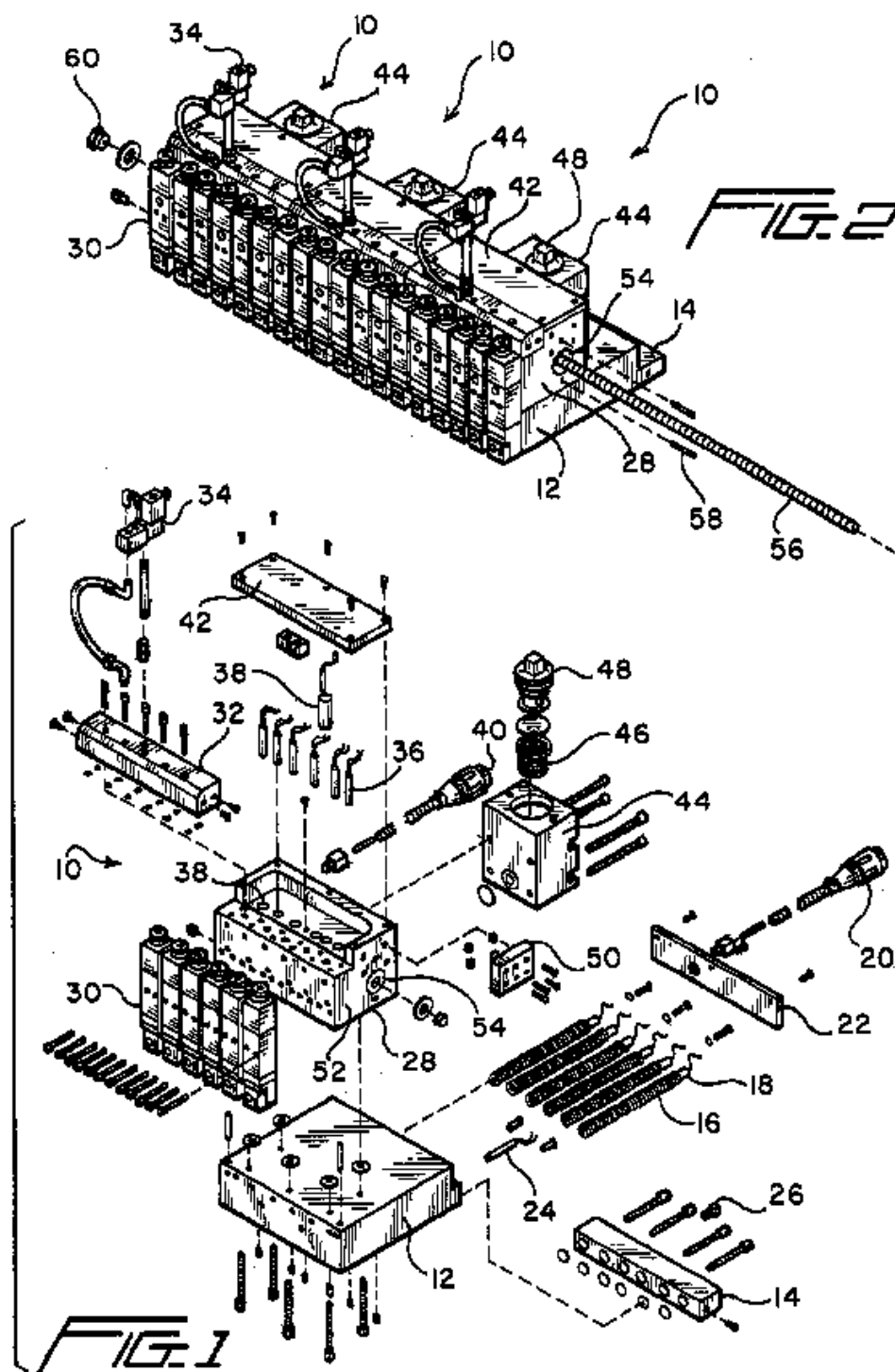
*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

**U.S. Patent**

Jul. 17, 2001

US 6,260,583 B1



## **F16K 29/00**

Arrangements for movement of valve members other than for opening and closing the valve, e.g. for grinding-in, for preventing sticking

## **F16K 31/00**

[N: Actuating devices;] Operating means; Releasing devices  
[N: (regulating means G05D)]

### **References relevant to classification in this group**

*This subclass/group does not cover:*

Magnetic constructions with armature (actuators)	<a href="#">H01F 7/08</a>
Control or regulation of electric motors	<a href="#">H02P 7/00</a>

## **F16K 31/002**

[N: actuated by temperature variation (thermo-electric F16K31/025)]

### **References relevant to classification in this group**

*This subclass/group does not cover:*

Shape memory alloy	<a href="#">F03G 7/065</a>
Sensitive elements producing movements (e.g. bimetallic strips).	<a href="#">G12B 1/02</a>

## **F16K 31/003**

[N: operated without a stable intermediate position, e.g. with snap action (F16K31/56 takes precedence)]

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

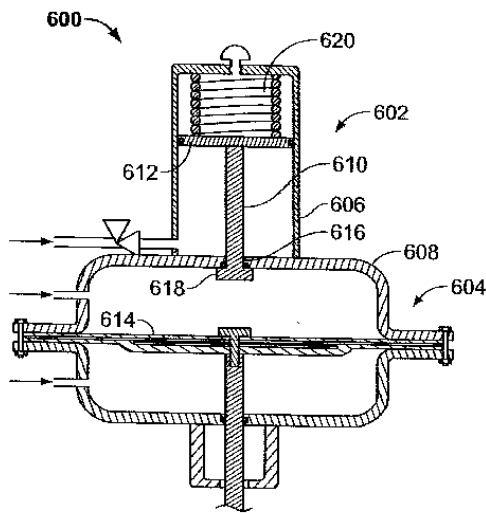


FIG. 6A

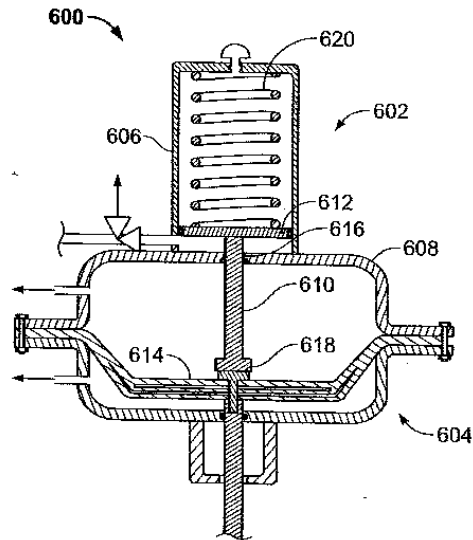


FIG. 6B

WO 2010/057937

12/12

PCT/US2009/069794

## F16K 31/004

[N: actuated by piezo-electric means]

### Informative references

Attention is drawn to the following places, which may be of interest for search:

Piezo-electric devices	<a href="#">H01L 41/00</a>
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## F16K 31/02

electric [N: (F16K31/004 takes precedence)]; magnetic

### References relevant to classification in this group

This subclass/group does not cover:

Magnetic circuits and magnets in general	<a href="#">H01F</a>
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## F16K 31/04



**using a motor**

**References relevant to classification in this group**

*This subclass/group does not cover:*

Details of the magnetic circuit of the motor	<a href="#">H02K 1/00</a>
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**F16K 31/0603**

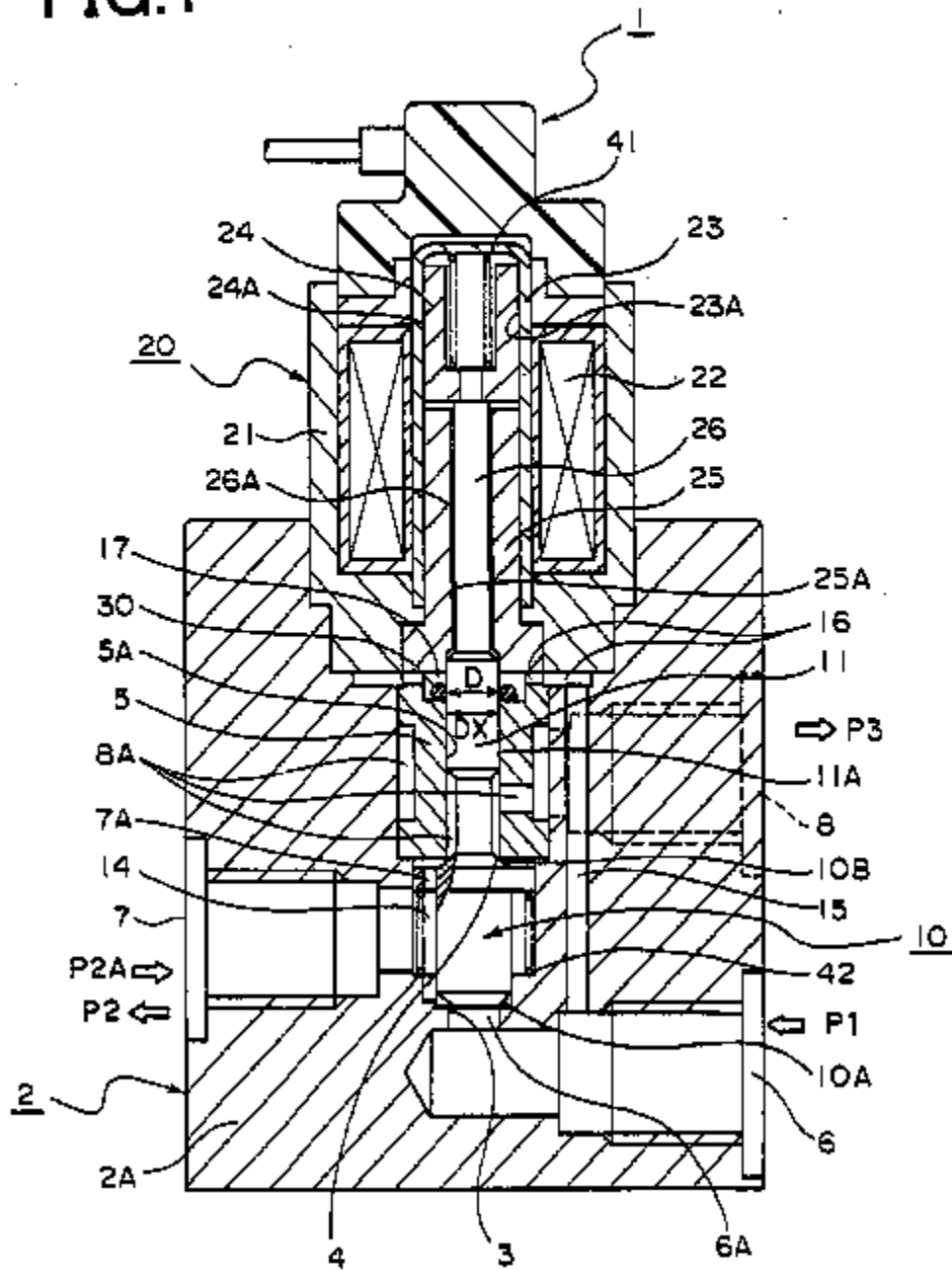
**[N: Multiple-way valves]**

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

FIG.1



F16K 31/0613

[N: with cylindrical slides]

**Definition statement***This subclass/group covers:*

Illustrative example of subject matter classified in this group.

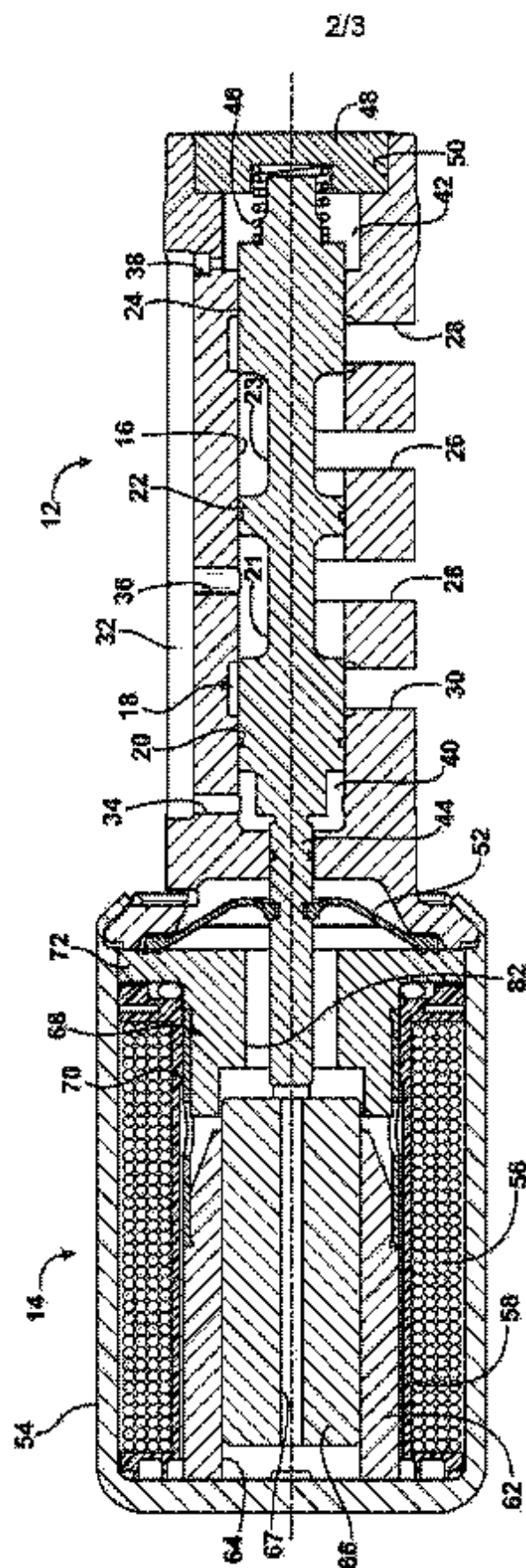


FIG. 2

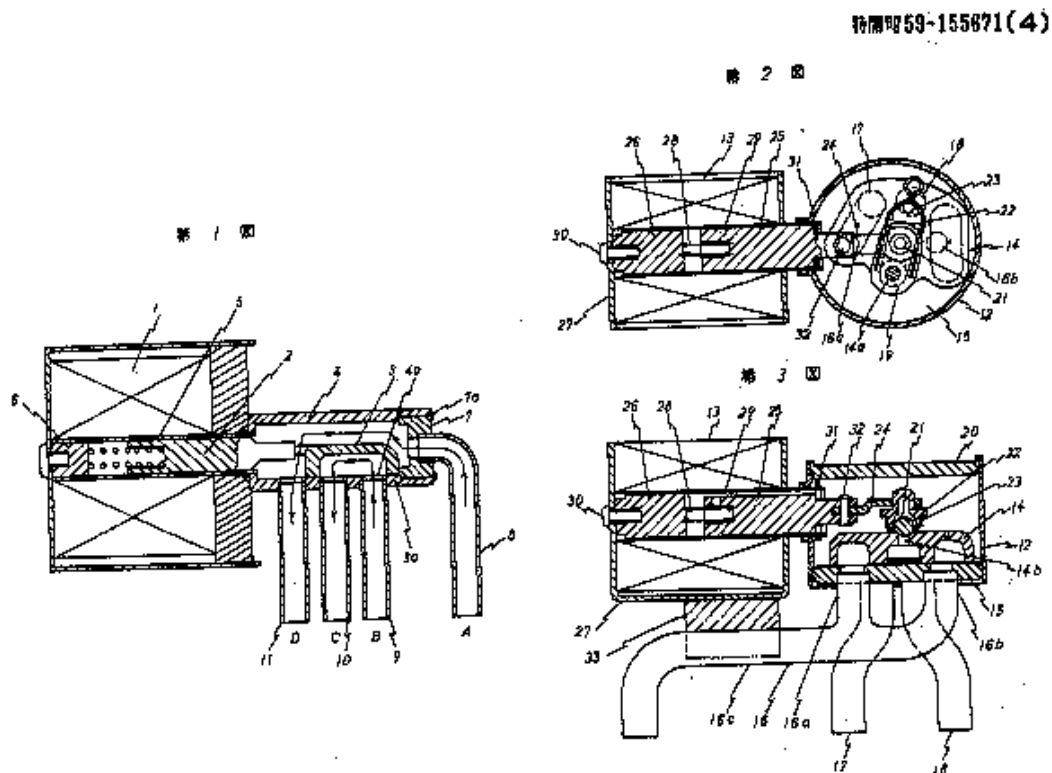
## F16K 31/0617

[N: with flat slides]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



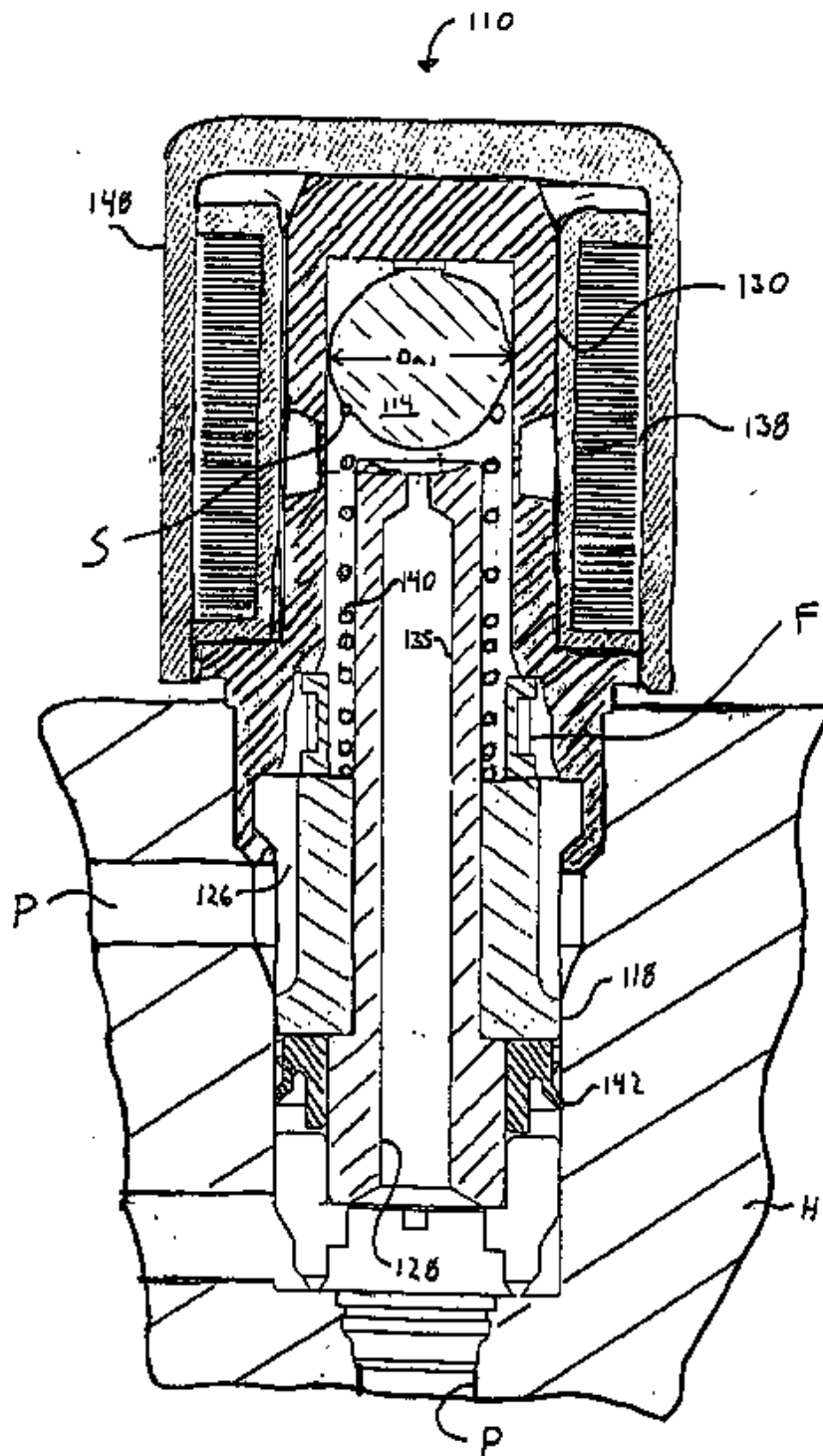
## F16K 31/062

[N: the valve element being at least partially ball-shaped]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



**F16K 31/0627**

[N: with movable valve member positioned between seats]

**Definition statement**

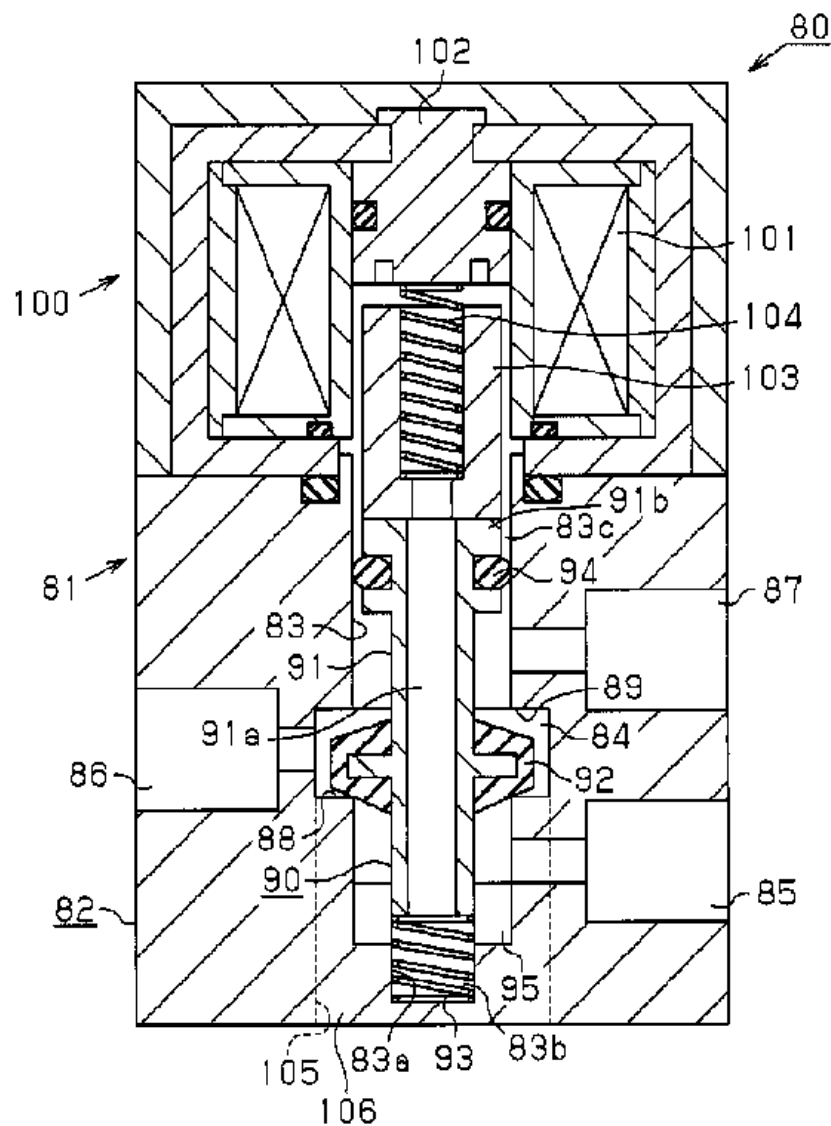
*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

WO 2011/122147

PCT/JP2011/053369

[圖4]



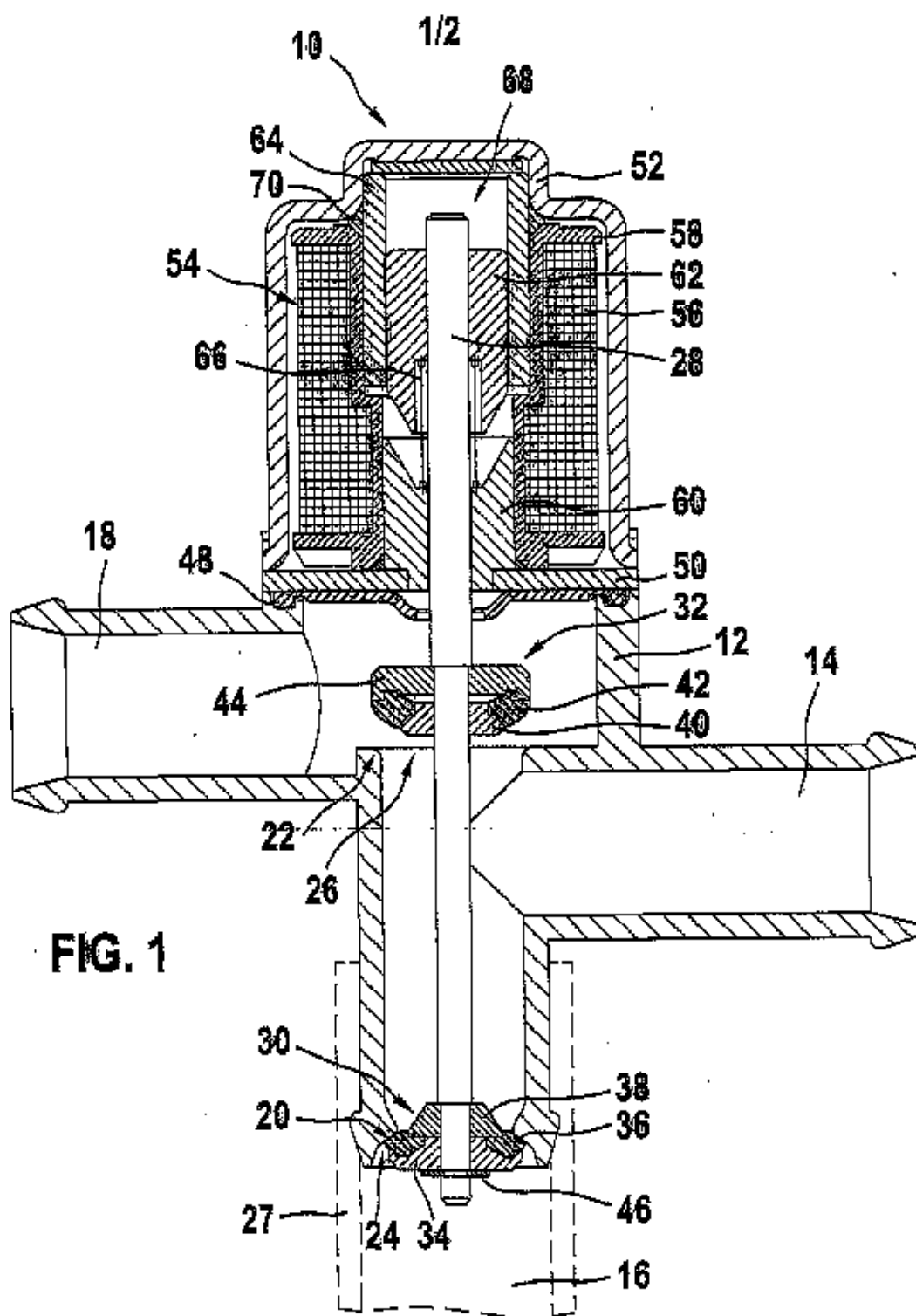
## F16K 31/0634

[N: with fixed seats positioned between movable valve members]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.



**F16K 31/0648**

**[N: the armature and the valve member forming one element (F16K31/0651 takes precedence)]**

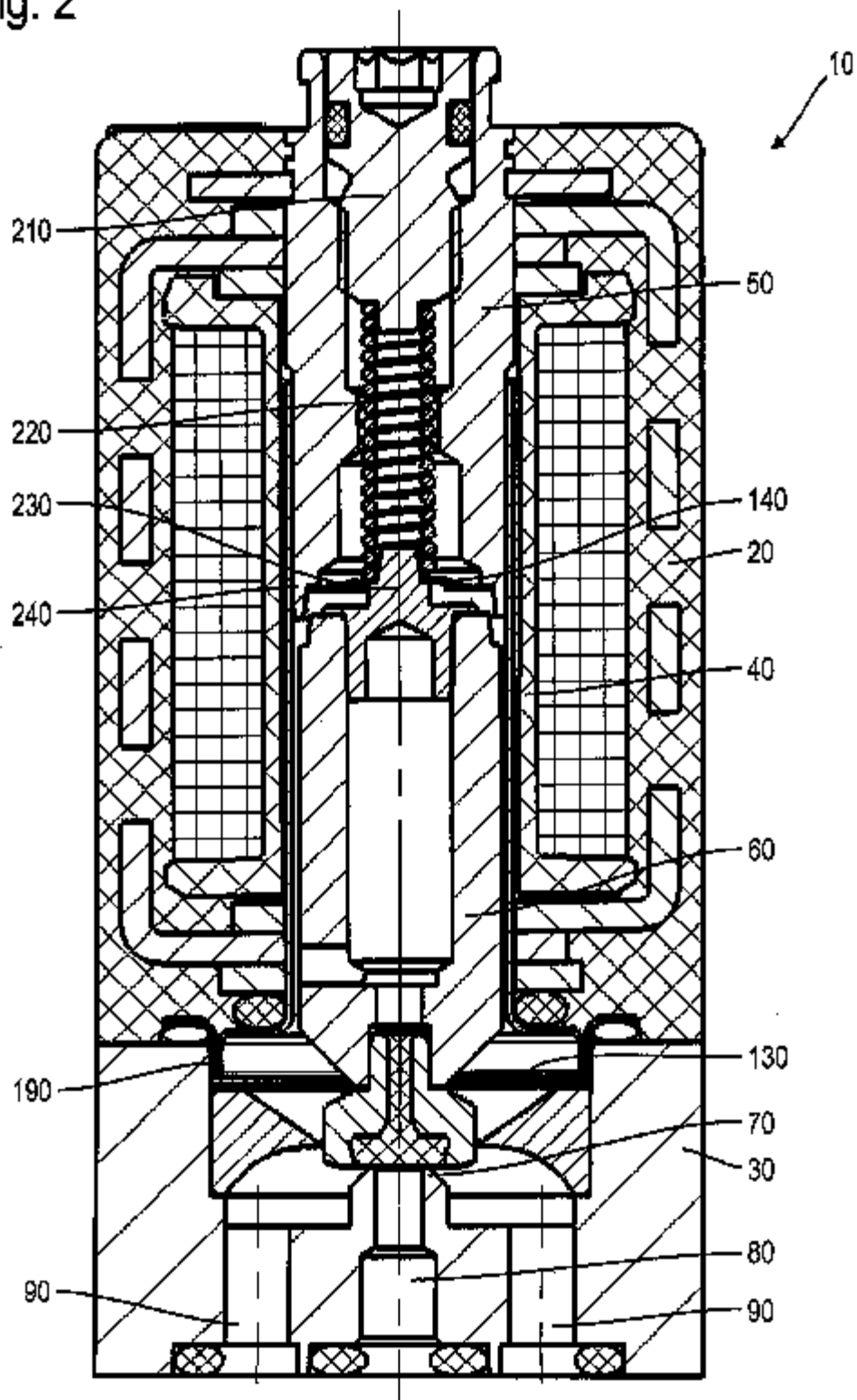


## **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

Fig. 2



F16K 31/0658

**[N: Armature and valve member being one single element]**

### Definition statement

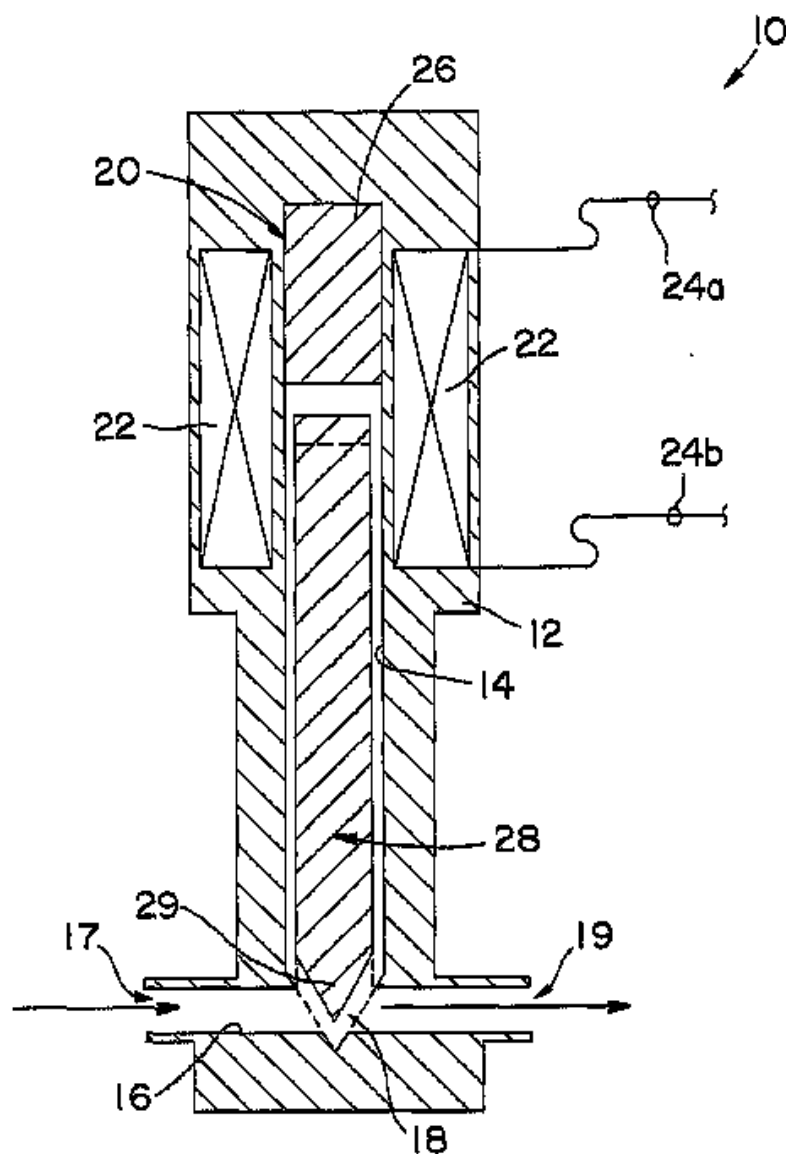
*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

**WO 02/103720**

PCT/US02/18826

1/1



**F16K 31/60**

**Handles [N: form, features or function of taps or faucet handles for domestic plumbing installations E03C1/04]**

**References relevant to classification in this group**

*This subclass/group does not cover:*

Form, features and function of taps or faucets handles	<a href="#">E03C 1/04</a>
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**F16K 33/00**

**Floats for actuation of valves or other apparatus [N: (float actuated valves F16K31/18)]**

**Definition statement**

*This subclass/group covers:*

Construction of the float per se.

**F16K 35/00**

**Means to prevent accidental or unauthorised actuation**

**Definition statement**

*This subclass/group covers:*

Locking or interlocking the valve actuating device. Not the lock per se.

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Locks	<a href="#">E05B</a>
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**F16K 37/00**

**Special means in or on valves or other cut-off apparatus for indicating or recording operation thereof, or for enabling an alarm to be given**

**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Testing or monitoring control systems or parts; Electric testing	<a href="#">G05B</a>
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## **F16K 37/0075**

**[N: For recording or indicating the functioning of a valve in combination with test equipment]**

### **References relevant to classification in this group**

*This subclass/group does not cover:*

Testing or monitoring control systems or parts; Electric testing	<a href="#">G05B 23/02</a>
Above ground control means for valves in boreholes or wells	<a href="#">E21B 34/16</a>
Testing static or dynamic balance of machines or structures; Investigate fluid-tightness (leaks)	<a href="#">G01M 3/00</a>

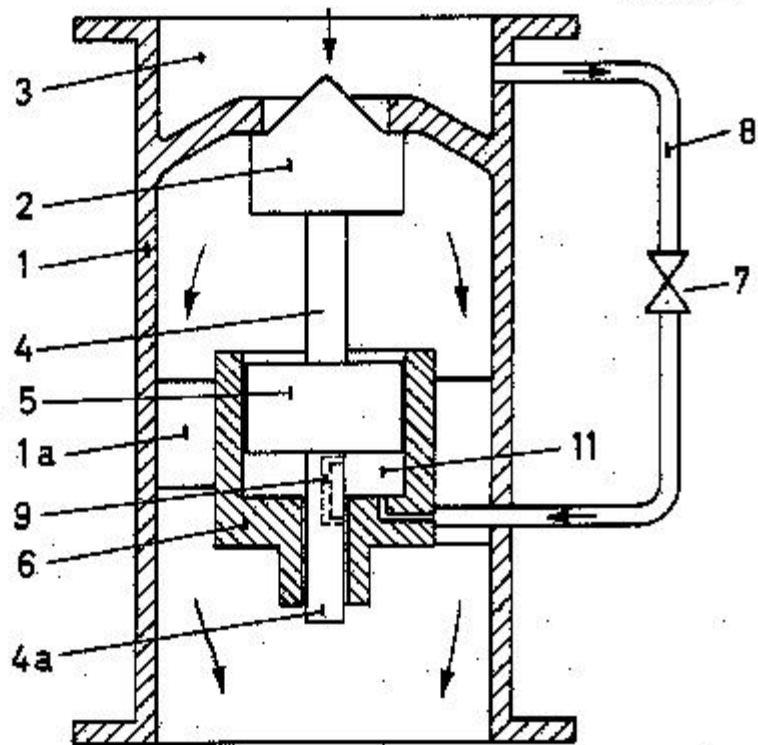
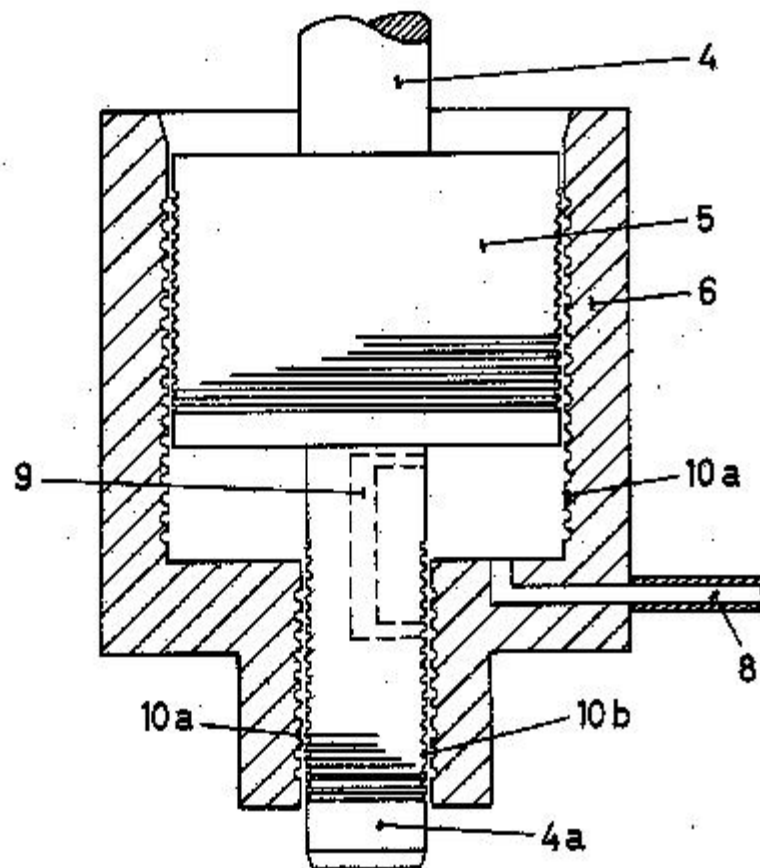
## **F16K 39/00**

**Devices for relieving the pressure on the sealing faces**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

Abb. 1Abb. 2

## Spindle sealings

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.

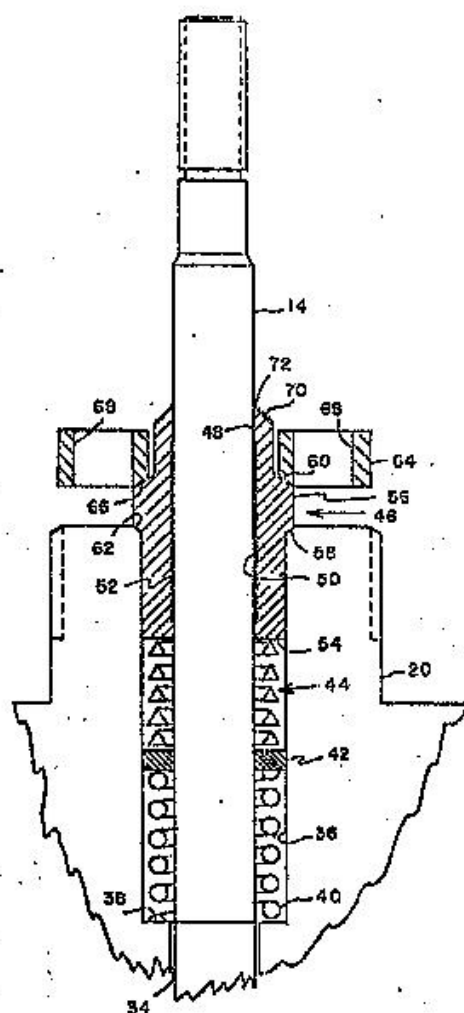
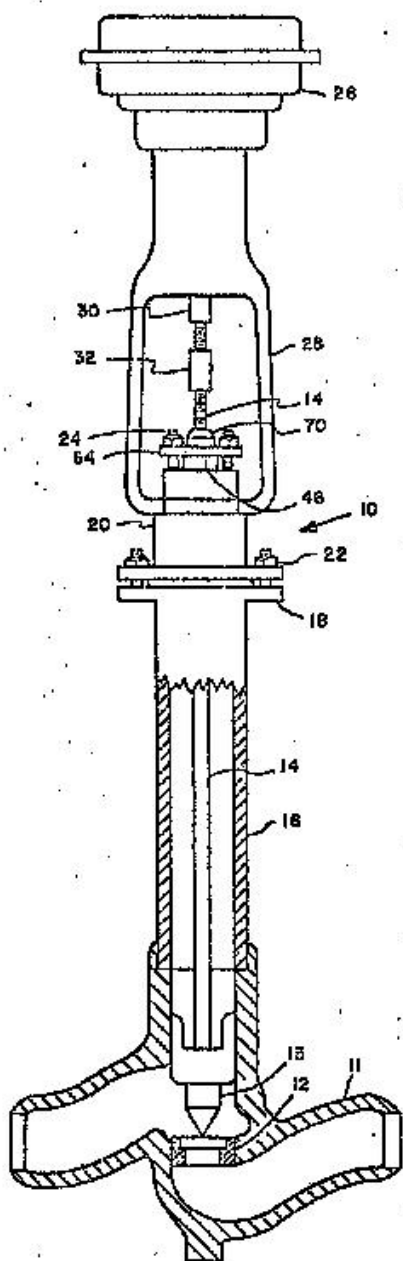


Fig. 2

A.J. Hansen 3

## F16K 41/003

[N: by fluid]

### Definition statement

*This subclass/group covers:*

It refers to sealings by fluid in general, not only liquid.

## **F16K 41/02**

**with stuffing-box [N: sealing ring]**

### **Definition statement**

*This subclass/group covers:*

Sealings with stuffing-box OR sealing ring.

## **F16K 43/00**

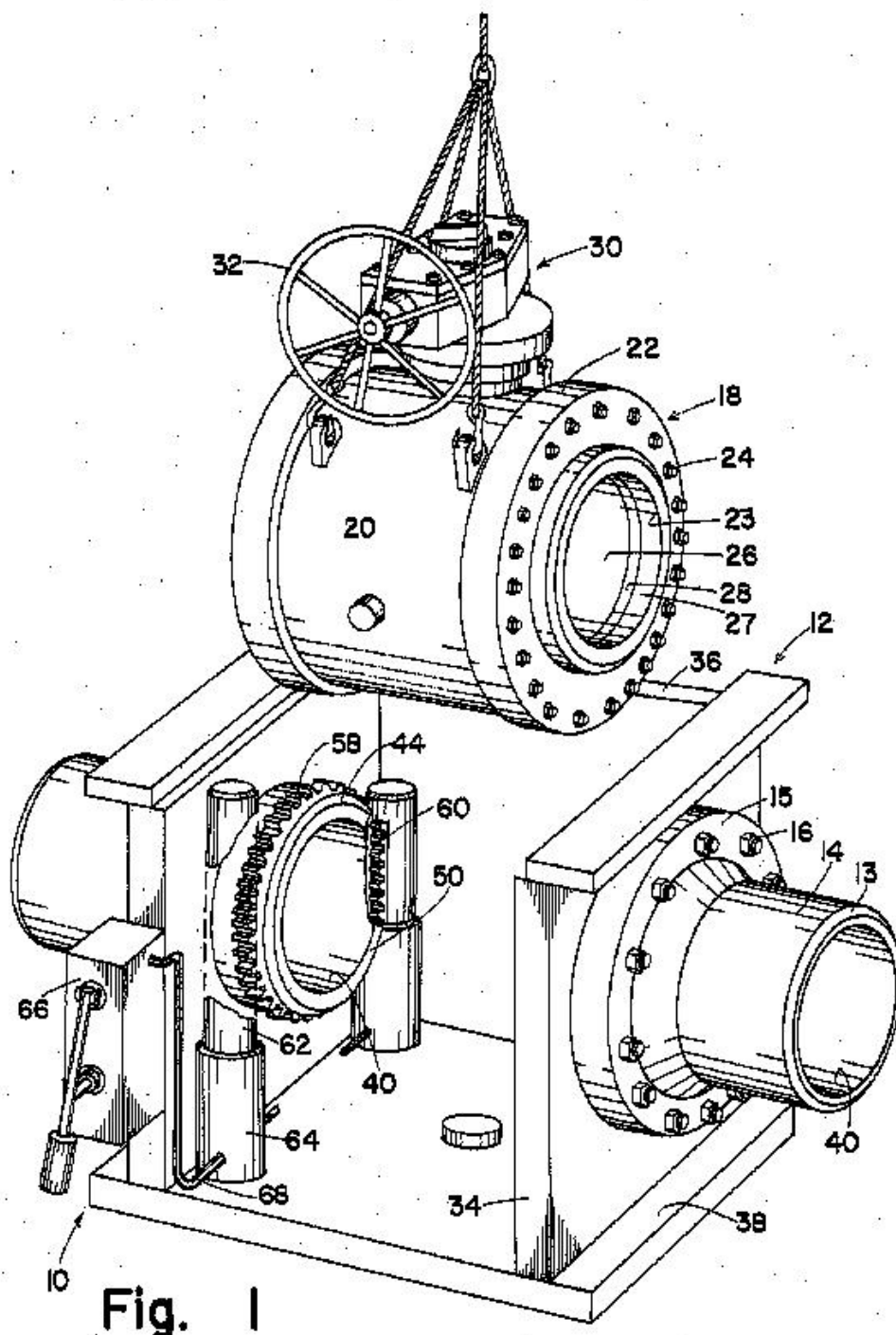
**Auxiliary closure means in valves, which in case of repair, e.g. rewashing, of the valve, can take over the function of the normal closure means; Devices for temporary replacement of parts of valves for the same purpose**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in this group.





**F16K 47/00**

**Means in valves for absorbing fluid energy [N: e.g. cushioning of opening or closure movement, eliminating of vibrations of the valve member] (for pipes F16L55/00)**

## **F16K 49/00**

Means in or on valves for heating or cooling (for pipes F16L53/00; thermal insulation in connection with pipes or pipe systems F16L59/16)

## **F16K 51/00**

Other details not peculiar to particular types of valves or cut-off apparatus

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Housings	<a href="#">F16K 27/07</a>
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## **F16K 99/00**

Subject matter not provided for in other groups of this subclass

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Microvalves	<a href="#">F16K 99/0001</a>
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## **F16K 99/0001**

[N: Micro-valves (micro-devices B81B1/00; manufacture or treatment of devices or systems in or on a substrate B81C1/00; micro-fluidic structures B01L3/5027; micro-pumps F04B19/006 )]

### **Relationship between large subject matter areas**

[B01F 13/0059](#) - Micromixers.

[B01L 3/00](#) - Containers or dishes for laboratory use.

[B81B 1/00](#) - Micro-capillary devices in general.

[B81B 7/00](#) - Micro-structural systems (Auxiliary parts of micro-structural devices or systems.)

[B81C 1/00](#) - Microstructural technology.

[B01J 19/0093](#) - Microreactors.

[F04B 19/006](#) - Micropumps.

[F04B 43/043](#) - Membrane micropumps.

[G01N 27/447](#) - Electrophoresis for analysis in microdevices.

See also: [B81B 2201/054](#) - Micro-valves, [B81B 2203/0127](#) - Diaphragms, membranes for micro-electromechanical structures.